A TOXICITY STUDY ON

"SANGU PARPAM"

Dissertation Submitted To

THE TAMILNADU Dr.M.G.R MEDICAL UNIVERSITY

Chennai – 32

For the Partial fulfillment in Awarding the Degree of

DOCTOR OF MEDICINE (SIDDHA)

(Branch – VI, Nanju Noolum Maruthuva Neethi Noolum)

Department of Nanju Noolum Maruthuva Neethi Noolum

Government Siddha Medical College

Palayamkottai – 627 002

OCTOBER – 2018

GOVT. SIDDHA MEDICAL COLLEGE, PALAYAMKOTTAI

DECLARATION BY THE CANDIDATE

I hereby declare that this dissertation entitled "**A Toxicity Study on SANGU PARPAM**" is a bonafide and genuine research work carried out by me under the guidance of **Dr. M. P. ABDUL KADER JEYLANI**, **M.D(s).,** Professor, Post Graduate Department of Nanju Noolum Maruthuva Neethi Noolum, Govt.Siddha Medical College, Palayamkottai, and the dissertation has not formed the basis for the award of any Degree, Diploma, Fellowship or other similar title.

Date: **Signature of the Candidate**

Place: Palayamkottai **Dr.K. BALASUBRAMANIAN**

CERTIFICATE

This is to certify that the dissertation entitled **"A TOXICITY STUDY ON SANGU PARPAM"** is a bonafide work done by **Dr. K. BALASUBRAMANIAN (Reg.No. 321516003)** Govt.Siddha Medical College, Palayamkotai in partial fulfillment of the university rules and regulations for award for **MD(s) Nanju Noolum Maruthuva Neethi Noolum** under my guidance and supervision during the academic year 2015-2018.

Name and signature of the Guide :

Name and signature of the Head of Department:

Name and signature of the Principal:

ACKNOWLEDGEMENT

First and foremost, I thank the "Almighty God" who's always been as strength wisdom and guides throughout the process of bringing out my Dissertation work successfully. And also I wish to thank my parents **Mr. K. Karuppaiah** & **Mrs. K. Mekala** who are always behind me to support.

I wish to express my sincere thanks to the **Vice Chancellor, The Tamil Nadu Dr.M.G.R Medical University**, Chennai, **The Director of Indian Medicine and Homeopathy** and **The Joint Director of Indian Medicine and Homeopathy,** Chennai for their permission to take this study.

I also wish to convey my deep gratitude to the Principal, **Prof. Dr. R. Neelavathy, M.D.(s), Ph.D.,** and Vice Principal **Prof. Dr. S. Victoria, M.D.(s),** of Government Siddha Medical College, Palayamkottai.

I would like to express my deep and sincere gratitude to **Prof. Dr. M. Thiruthani M.D.(s),** Head of the Department, Department of Nanju Noolum Maruthuva Neethi Noolum, Government Siddha Medical College, Palayamkottai, for his encouragement, moral support, valuable guidance, Insightful advice, and constructive feedback during the entire period of this Dissertation work.

My cordial thanks to my guide **Dr. M.P. Abdul Kader Jeylani, M.D(s)** Professor**,** Department of Nanju Noolum Maruthuva Neethi Noolum, Government Siddha Medical College, Palayamkottai for his encouragement and valuable support and guidance during this Dissertation.

I am grateful to **Dr. A. Rajarajeswari, M.D.(s),** Lecturer, Grade-II Department of Nanju Noolum Maruthuva Neethi Noolum, Government Siddha Medical College, Palayamkottai for his advice and help in carrying out this Dissertation work successfully.

I thanks to **Dr. G.Chenthamarai Selvi, M.D(s),** Lecturer, Grade-II Department of Nanju Noolum Maruthuva Neethi Noolum, Government Siddha medical college, Palayamkottai for her guidance, in carrying out this dissertation work.

I am grateful to **Dr.Balamani, M.D.(s),** Lecturer, Grade-II Department of Nanju Noolum Maruthuva Neethi Noolum, Government Siddha Medical College, Palayamkottai for her advice and help in carrying out this Dissertation work successfully.

I am grateful to **Dr.Thirumavalavan, M.D.(s),** Lecturer, Grade-II Department of Nanju Noolum Maruthuva Neethi Noolum, Government Siddha Medical College, Palayamkottai for his advice and help in carrying out this Dissertation work successfully.

It was my privelage to express my sincere thanks to **Prof. N. Nagaprema, M.Sc.,** Head of the Department and all the Staffs of Biochemistry department, Government Siddha Medical College, Palayamkotai for their help in biochemical analysis for their work.

My sincere thanks to **Dr.M. Kalaivanan, M.Sc., Ph.D.,** Senior Lecturer, P.G. Department of Pharmacology, Government Siddha Medical College, Palayamkottai for his valuable guide regarding Animal Studied in this Dissertation Work.

My sincere thanks to **Dr.S.Sudha, M.Sc., M.Ed., Ph.D.,** Associate Professor, Department of Medicinal Botany, Government Siddha Medical College, Palayamkottai for the guidelines in identification of herbal drugs.

I take an opportunity to express my heartful thanks to **Mr. Santhanakumar,** HOD, Department of Pharmacology, Arulmigu Kalasalingam College of University, Krishnankoil. For their help in conducting, Toxicity Studies associated with this dissertation.

I express my thanks to **Dr. N. Chandra Sekar**, Retired Professor and Head Centre for Geology and Marine technology, Manonmaniam Sundaranar University, Tirunelveli for the guidelines in identification of minerals, raw drugs.

I would like to pay my best regards to **Dr. Murugesan, Scientific officer, Grade I, SAIF, IIT, Chennai – 36** for carrying out for the qualitative and quantitative analysis of the drug chosen by me for my dissertation work.

I express my thanks to the Librarian, **Tmt. T. Poonkodi, M.A., MLIS** and her staffs for their cooperation during the study.

I grateful to thank **Dr. K. Arunachalam**, **M.D(s).,** My senior in helping me with drug preparation and directing me with my dissertation work.

I wish to thank my UG classmates **Dr. M. Mukilan, Dr. R. Kirubakaran, Dr. T. Murugavel, Dr. M. Veerasivaraman**, help me in carrying out this dissertation work.

I thank my friends **Dr.T.Aparna, Dr. R. Agalya, Dr. U. Deepti sarada, Dr. V. Gunasundhari, Dr. T. Jency Risha, Dr. M. N. Parandhaman, Dr.M.Praba, Dr. K. Velmurugan, Dr. B. Vikesh** of **Nanju Noolum Maruthuva Neethi Noolum** department of their timely help in completing this dissertation work.

Finally, I am very thankful to the computer centre **Maharaja DTP services** Tiruchendur road, Palayamkottai for his kind co-operation in bringing out this dissertation work in an excellent format.

The Tamil Nadu Dr.M.G.R.Medical University

69, Anna Salai, Guindy, Chennai - 600 032.

This Certificate is awarded to Dr/~~Mr/Mr~~s.....K.:...BALASUBRAMANIAN:.....

For participating as ~~Resource Perso~~n / Delegate in the Twenty second Workshop on

"RESEARCH METHODOLOGY & BIOSTATISTICS"

*For **AYUSH Post Graduates & Researchers***

Organized by the Department of Siddha

The Tamil Nadu Dr. M.G.R. Medical University From 06th to 10th June 2016.

Dr.N.KABILAN, M.D.(S)
PROF & HEAD
DEPT.OF SIDDHA

Prof.**Dr.S.PUSHKALA,** M.D.,
REGISTRAR (FAC)

Prof. **Dr.S.GEETHALAKSHMI,** M.D., Ph.D.,
VICE CHANCELLOR

SATHYABAMA

INSTITUTE OF SCIENCE AND TECHNOLOGY
CHENNAI – 600 119

CENTRE FOR LABORATORY ANIMAL TECHNOLOGY AND RESEARCH

(CPCSEA Approved)

WORKSHOP ON

TOXICOLOGICAL PROFILING AND ASSESSMENT OF TOXICITY OF DRUGS ON LAB ANIMALS

CERTIFICATE

This is to certify that Dr./~~Mr.~~/~~Ms.~~ K. BALASUBRAMANIAN

of Govt. Siddha Medical college and Hospital, Palayamkottai has participated in the two-day workshop on "**TOXICOLOGICAL PROFILING AND ASSESSMENT OF TOXICITY OF DRUGS ON LAB ANIMALS**" organized by the Centre for Laboratory Animal Technology and Research, Sathyabama Institute of Science and Technology, Chennai during 24 - 25TH January, 2018.

Dr. B. SHEELA RANI
Coordinator

Dr. B. SHEELA RANI, M.S. (By Research), Ph.D.,
DIRECTOR (RESEARCH)
SATHYABAMA
INSTITUTE OF SCIENCE AND TECHNOLOGY
(DEEMED TO BE UNIVERSITY)
Jeppiaar Nagar, Rajiv Gandhi Salai,
Chennai - 600 119.

Dr. R. SELVARAJ
Convener

GOVT. SIDDHA MEDICAL COLLEGE & HOSPITAL, PALAYAMKOTTAI

SCREENING COMMITTEE

Candidate Reg. No:

Department : NANJU NOOLUM MARUTHUVA NEETHI NOOLUM (BRANCH-VI)

This is to certify that the dissertation topic A Toxicity study on " SANGU PARPAM" has been approved by the screening committee.

Branch	Department	Name	signature
I	Pothu Maruthuvam	Prof.Dr.A.Manoharan MD(S)	
II	Gunapadam	Dr.A.Kingsly MD(S) Associate professor	
III	Sirappu Maruthuvam	Prof.Dr.A.S.Poongodi kanthimathi MD(S)	
IV	Kuzhanthai Maruthuvam	Prof.Dr.D.K.SoundararajanMD(S)	
V	Noi Nadal	Prof.Dr.S.Victoria MD(S)	
VI	Nanju Noolum Maruthuva Neethi Noolum	Prof.Dr.M.Thiruthani MD(S)	

Remarks:

INSTITUTIONAL ETHICAL COMMITTEE,
GOVERNMENT SIDDHA MEDICAL COLLEGE,PALAYAMKOTTAI,
TIRUNELVELI - 627002,
TAMIL NADU, INDIA.
Ph: 0462-2572736/2572737/2582010
Email ID: gsmc.palayamkottai@gmail.com Fax: 0462-2582010

F.No.GSMC/5676/P&D/Res/IEC/2014 Date: 20.07.2016

CERTIFICATE OF APPROVAL

Address of Ethical Committee	Government Siddha Medical College, Palayamkottai, Tirunelveli, Tamil Nadu, India. Pincode: 627002.
Principal Investigator	Dr.K.BALASUBRAMANIAN.MD(s) – I Year, Department of PG Nanju Noolum Maruthuva Neethi Noolum, Reg.No.:
Guide	Dr.M.P.ABDUL KADER JEYLANI,M.D(s) READER Department Of Nanju Noolum Maruthuva Nethi Noolum, Govt. Siddha Medical College and Hospital,Palayamkottai,TirunelveliDistrict.
Head Of The Department	Dr. M. Thiruthani, MD(s), PGDYN, H.O.D., Department of Nanju Noolum Maruthuva Neethi Noolum,
Dissertation Topic	A Toxicity study on "**SANGU PARPAM".**
Documents Filed	1) Protocol.
Clinical / Non Clinical Trial Protocol	Non Clinical Trial Protocol
Informed Consent Document	NA
Any other Documents	NA
Date of IEC Approval & its Number	GSMC/3-IEC/2016/VI-49/20.07.2016

We approve the trial to be conducted in its presented form.

The Institutional Ethical Committee expects to be informed about the process report to be submitted to the IEC at least annually of the study, any SAE occurring in the course of the study,changes in the protocol and submission of final report.

20/7/16

Chairman
(Prof. Dr.M.LOGAMANIAN)

26/7/16

Member Secretary
(Prof.Dr.S.Victoria)

GOVERNMENT SIDDHA MEDICAL COLLEGE PALAYAMKOTTAI

CERTIFICATE OF BOTANICAL AUTHENTICITY

Certified the following plant drug used in Siddha formulation (Internal) **Sangu Parpam** for Maradaippu, Marpuerichal, Nenchuvali, Neerchurukku, Vellai, etc.,taken up for Post-Graduation Dissertation Studies by **Dr. K. Balasubramanian** PG Scholar MD Siddha, Department of Toxicology, are correctly identified and authenticated through Visual inspection / Organoleptic Characters / Experience, Education & Training morphology Microscopically and Taxonomical methods.

Table 1: Ingredients of SANGU PARPAM

S.NO	Drug	Botanical Name	Family	Parts Used
1	KEEZHANELLI	*Phyllanthus amarus*	Euphorbiaceae	Whole plant

Station : Palayamkottai

Date: 5/3/18

Authorized Signature

Dr. S. SUTHA, M.Sc.,M.Ed.,Ph.D.,
Associate Professor
Dept. of Medicinal Botany
Govt. Siddha Medical College
Palayamkottai, Tirunelveli - 2.

GOVERNMENT SIDDHA MEDICAL COLLEGE PALAYAMKOTTAI

CERTIFICATE OF MINERAL AUTHENTICITY

Certified the following the Marine (Jeevam) drug used in Siddha formulation (Internal) SANGU PARPAM for Maradaippu, Marpuerichal, Neer churukku etc., taken up for Post-Graduation Dissertation Studies by **Dr. K. Balasubramanian** PG Scholar of MD Siddha, Department of Toxicology, have selected the raw drug(Marine) and have been authenticated through experience and field study.

S.NO	Drug	Chemical Name
1	SANGU	Turpinella pyrum

Station : Palayamkottai

Date: 2/02/2018

Authorized Signature

Dr. N. CHANDRASEKAR
PROFESSOR & HEAD
CENTRE FOR GEOTECHNOLOGY
MANONMANIAM SUNDARANAR UNIVERSITY
TIRUNELVELI - 627 012

Arulmigu Kalasalingam College of Pharmacy

(Approved by AICTE, PCI, New Delhi and Affiliated to The Tamil Nadu Dr.M.G.R. Medical University, Chennai)
Anand Nagar, Krishnankoil - 626 126. Srivilliputtur (Via), Virudhunagar Dist., Tamil Nadu
Phone: 04563-289006 Email: akcpprl@yahoo.com Website: www.akcp.ac.in

"Kalvivallal"
T.Kalasalingam, B.Com., Founder

"Ilayavallal"
Dr.K.Sridharan, M.Com., MBA., Ph.D., Chairman

Dr.S.Arivalagi, M.B.B.S., Correspondent

Dr.S.Shasi Anand, Ph.D., (USA) Secretary

Er.S.Arjun Kalasalingam, M.S., (USA) Director

Dr.N.Venkateshan, M.Pharm., Ph.D., Principal

CERTIFICATE

INSTITUTIONAL ANIMAL ETHICAL COMMITTEE APPROVED BY CPCSEA, NEW DELHI

Name of the principle investigator	: Dr. K.BALASUBRAMANIAN
Title of the Project	: A TOXICITY STUDY ON **"SANGU PARPAM"**
Proposal Number	: AKCP/IAEC/30/18-19
Date of received after modification (If any)	: NIL
Approval Date	: 19.01.2018
Animals	: Rats
Expiry Date	: NIL
Name of IAEC Chairperson	: Dr.N.Venkateshan

Signature of IAEC Chairperson

CONTINUING MEDICAL EDUCATION PROGRAMME

Organized by

POST GRADUATE DEPARTMENT OF NANJU NOOLUM MARUTHUVA NEETHI NOOLUM

GOVT. SIDDHA MEDICAL COLLEGE, Palayamkottai

CERTIFICATE

This is to Certify that Dr.....K. BALASUBRAMANIAN.....

..... has actively

*participated in the continuing Medical Education programme held on **01st June 2018**.*

at Govt. Siddha Medical College, Palayamkottai

Prof.Dr. M.P.ABDUL KADER JEYLANI, M.D(s)
Co-ordinator

Prof.Dr. M. THIRUTHANI, M.D(s)
Head of the Dept.

Prof.Dr. R.NEELAVATHI, M.D(s).,Ph.D
Principal

INTERNATIONAL JOURNAL OF CURRENT RESEARCH IN BIOLOGY AND MEDICINE

ISSN: 2455-944X

e-ISJN: A4372-3062; p-ISJN: A4372-3065

www.darshanpublishers.com

IMPACT FACTOR: 2.795, ICV:84.13 (2016)

Editorial Board Member of

International Journal of Current Research in Biology and Medicine (IJCRBM)

is hereby awarding this certificate to

Balasubramanian K[1]*, Praba M[2], Thiruthani M[3]

[1,2] PG Scholars, Department of Nanju Noolum Maruthuva Neethi Noolum, Govt. Siddha Medical College, Palayamkottai, TamilNadu, India.

[3]HOD, Department of Nanju Noolum Maruthuva Neethi Noolum, Govt. Siddha Medical College, Palayamkottai, TamilNadu, India.

***Corresponding author:** Dr.K.Balasubramanian, PG scholar, Department of Nanju Noolum Maruthuva Neethi Noolum, Govt. Siddha Medical College, Palayamkottai, TamilNadu, India. E- mail: *drkbalasubramanian91@gmail.com*

In recognition of the publication of the paper entitled **"Standardization and characterization of Siddha Herbo-mineral formulation "Visha Kuzhambu" through FTIR."** published in IJCRBM Journal, Volume: 3, Issue: 6, Year: 2018.

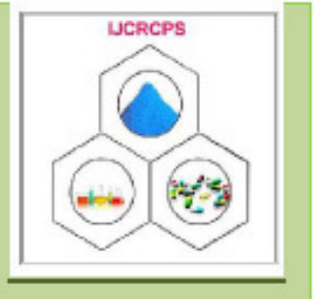
Dr. N.S. NEKI
Editor in Chief
IJCRBM
Website: www.darshanpublishers.com
E-mail: editorijcrbm@gmail.com

INTERNATIONAL JOURNAL OF CURRENT RESEARCH IN CHEMISTRY AND PHARMACEUTICAL SCIENCES (IJCRCPS)

ISSN : 2348 - 5213 (PRINT); ISSN : 2348-5221 (ONLINE)

www.ijcrcps.com

IMPACT FACTOR: 6.988; ICV:63.58(2016)



Editorial Board Member of

"International Journal of Current Research in Chemistry and Pharmaceutical Sciences"

is hereby awarding this certificate to

Agalya R[*1], Balasubramanian.K[*1],Thiruthani M[2]

[1]PG Scholars, Department of Nanju Noolum Maruthuva Neethi Noolum,(Siddha Toxicology)
Govt Siddha Medical College, Palayamkottai, Tamilnadu, India.

[2]HOD , Department of Nanju Noolum Maruthuva Neethi Noolum, (Siddha Toxicology)
Govt. Siddha Medical College, Palayamkottai, Tamilnadu, India

Corresponding author: **Dr. R. Agalya.**

PG Scholar, Department of Nanju Noolum Maruthuva Neethi Noolum, (Siddha Toxicology)
Govt. Siddha Medical College, Palayamkottai, Tamilnadu, India.

E- mail : agalyarathnam@gmail.com

In recognition of the publication of the paper entitled **"Standardization of "Kungiliya Parpam" through Fourier Transform Infrared Spectroscopy"** published in IJCRCPS Journal, Volume: 5, Issue: 5, Year: 2018.

Managing Editor
DARSHAN PUBLISHERS
8/173, Vengayapalayam,
Seerappalli (Po.), Rasipuram (Tk.),
Namakkal (Dt.)-637 406.
Tamil Nadu. India.

Editor in Chief
IJCRCPS
Website: www.ijcrcps.com
E-mail: editorijcrcps@gmail.com

Sl.No	CONTENTS	PAGE NO
1	**INTRODUCTION**	1
2	**AIM AND OBJECTIVE**	4
3	**REVIEW OF LITERATURE** ❖ SIDDHA ASPECTS ❖ MODERN ASPECTS	 6 23
4	**MATERIALS AND METHODS** ❖ PREPARATION OF MEDICINE	33
5	**QUALITATIVE AND QUANTITATIVE ANALYSIS** ❖ PHYSICO CHEMICAL ANALYSIS ❖ FTIR ❖ SEM ❖ ICP – OES	 34 36 40 41
6.	**PRE-CLINICAL STUDIES** ❖ ACUTE TOXICITY STUDY ❖ SUB-ACUTE TOXICITY STUDY	43 47
7.	**RESULTS** ❖ QUALITATIVE AND QUANTITATIVE ANALYSIS ❖ BIO-CHEMICAL ANALYSIS ❖ ACUTE TOXICITY ❖ SUB-ACUTE TOXICITY ❖ BIO-STATISTICAL ASPECTS	 53 60 62 70 94
8	**DISCUSSION**	96
9	**SUMMARY**	97
10	**CONCLUSION**	99
	BIBLIOGRAPHY	100

LIST OF TABLES

TITLE	Pg. No.
Table-1 Grouping and Marking of Animal	45
Table – 2 Numbering and Identification	45
Table – 3. Doses	45
Table-4 Animal Identification	48
Table – 5 Animal Marking	48
Table – 6 Dose level	49
Table – 7 Colour characters of SANGU PARPAM	53
Table – 8 Physicochemical analysis of samples of SANGU PARPAM	53
Table No. 9 : Particle size and pH of SANGU PARPAM	53
Table 10. Characteristic IR Absorptions	55
Table 11. Bio-chemical Analysis	60
Table 12. Effect of Acute Toxicity (14 Days) of *SANGU PARPAM* Physical and behavioral examinations.	62
Table-13 Showed the effect of Control – Distilled water (1ml/kg) on general behavior after single oral administration in Rat.	62
Table 14. Showed the effect of SANGU PARPAM (5mg/kg) on general behavior after single oral administration in Rat.	62
Table 15. Showed the effect of SANGU PARPAM (50mg/kg) on general behavior after single oral administration in Rat.	64
Table 16. Showed the effect of SANGU PARPAM (300mg/kg) on general behavior after single oral administration in Rat.	65
Table 17. Showed the effect of SANGU PARPAM (2000mg/kg) on general behavior after single oral administration in Rat.	66
Table 18. Home cage activity	67
Table 19. Hand held observation	67
Table.20 Mortality	68
Table 21. RESULTS OF SUB-ACUTE TOXICITY STUDY (28 DAYS) OF SANGU PARPAM ON BODY WEIGHT (IN GRAMS) (PHYSICAL PARAMETER)	70
Table:22 RESULTS OF SUB-ACUTE TOXICITY STUDY (28 DAYS) OF	71

SANGU PARPAM ON FOOD INTAKE IN grams.	
Table:23 RESULTS OF SUB-ACUTE TOXICITY STUDY (28 DAYS) OF SANGU PARPAM ON WATER INTAKE IN (grams).	72
Table:24 RESULTS OF SUB-ACUTE TOXICITY STUDY (28 DAYS) OF SANGU PARPAM ON ORGAN WEIGHT IN (grams).	73
Table:25 Shows the effect SANGU PARPAM on Hematological parameters in rats after 28 days treatment	74
Table : 26 RESULTS OF SUB- ACUTE TOXICITY STUDY (28 DAYS) OF SANGU PARPAM ON BIOCHEMICAL PARAMETERS	77
Table : 27 Acute Toxicity Study Analysis	
Table : 28 Subacute Toxicity Study Analysis	

ABBREVIATIONS

SP	Sangu Parpam
No.	Number
Mg	Milligram
Kg	Kilogram
LD_{50}	Lethal $Dose_{50}$
ED_{50}	Effective $Dose_{50}$
p.o	peros
ML	Milliliter
%	percentage
R&D	Research and Development
EDTA	Ethylene Diamine Tetra Acetic Acid
M	Male
g%	Gram percentage
g	Gram
NOAEL	No-Observed-Adverse-Effect-Level
MLD	Minimum Lethal Dose
MTD	Maximum Tolerated Dose
OECD	Organization of Economic Co-operation and Development
CPCSEA	Committee for the Purpose of Control and Supervision of Experiments on Animals
FTIR	Fourier Transform – Infra Red Spectroscopy
SEM	Scanning Electron Microscopy
ICP-OES	Inductively Coupled Plasma Optical Emission-Spectrometry
LD	Low Dose
MD	Middle Dose
HD	High Dose
BDL	Below Detection Limit

INTRODUCTION

Medicine is not merely a science but an art as well. The science of medicine is important to man's well being and survival. Siddha system is considered to be one of the traditional system of medicine with prestigious background of Tamil culture. Siddha is a complete holistic medical system that was founded by the siddhars.

The word 'siddha' comes from the word 'siddhi' which means an object to be attained or perfection or heavenly bliss. Siddhi generally refers to astama siddhi (ie) eight super natural powers. Which are enemurated as anima, mahima, lagima etc. as mentioned in silappathigaram. Those who achieved the above said powers are known as "Siddhars".

Siddhars are those who lived and maintained their bodies as they desired best. They were most of Tamil Saiva sect which maintained siva for its God, and rejected everything else. They are the greatest men holding tremendous powers in themselves by way of yoga practice and rejuvenation. They attained spiritual awakening by rousing, with their suppressed breathing, kundaline (Serpent power as it termed), lying dormant at the base of the spinal column,

Siddha system emphazies not only a healthy body but also sound mind and soul. The predominant aim of siddha science is to assure the full span of long healthy life to enable man acquire knowledge, cultivate good characters and conduct with which they could enjoy their legitimate worldly pleasures and ultimately attain salvation.

The universe is made up of five basic elements viz. Earth, water, fire, Air and space which are also present in human. Alteration of this basic elements in human body leads to vitiation of three humours. Siddha system of medicine is mainly based on this three humoral theory namely vatham, pitham and kapham are in definite proportions 1: ½ : ¼ respectively. Any alteration in this ratio of humor cause disease in human body.

In siddha system of medicine understanding the human body mechanism starts from the knowledge of cosmogenensis. The nature and humans are interrelated. The elements exist in the universe exist in human.

"அண்டத்திலுள்ளதே பிண்டம்

பிண்டத்திலுள்ளதே அண்டம்

அண்டமும் பிண்டமும் ஒன்றே

அறிந்துதான் பார்க்கும்போதே

- *சட்டமுனி ஞானம்*

Siddhar's massered alchemy and prepared medicine from plant, metal, minerals and animal kingdom mainly for rejuvenation of the body, which will help to attain salvation through good healthy life.

In siddha system, initally herbal preparation should be used for treatment, according to prognosis then metallic & mineral preparation should be given, this is portrated in the below lines,

"வேர்பாரு தாழைபாரு மிஞ்சினக்கால் மெல்லமெல்ல

பற்ப செந்தூரம் பாரே"

-Agathiyar pin -80

Though siddha system of medicine are traditionally practised in south India. Further development and distribution of siddha system medicine, standardization methods of drugs are to be done.

With growth of science and development of scientific methods of research, treatment of diseases now relies largely on evidence based medicines. Rigorous steps are followed and care is exercised in the introduction of new drugs.

As a part of standardization toxicity study is important. This ensures the safety therapeautic dose of a drug.

Toxicology is the science dealing with property, action, toxicity of a substance. "All drugs are poison- it is only the dose which makes a thing a poison". This statement by Paracelsus hold good even today. And also the same concept is revealed in tamil leterature as

"அளவுக்கு மிஞ்சினால் அமிர்தமும் நஞ்சு"

- *பழமொழி*

மற்றும்

"பீலிபெய் சாகாடும் அச்சிறும் அப்பண்டம்

சால மிகுத்து பெயின்"

-திருக்குறள்

Though siddha physician's wonder about their remedies with their medicines. We lack in scientific validation of the drug and misconception of other form of

medical practitioner, that is contains crude metal and mineral preparation which are said to be toxic.

In order to eradicate these misconception of siddha system, toxicity study over the drugs are important.

Toxicological screening is very important for the development of new drugs, extention of therapeautic potential of the existing molecule. They are mostly used to examine specific adverse effect. It also helps to calculate the no observed adverse effect level (NOAEL) dose and is helpful for clinical trials.

The drug "***SANGU PARPAM***" prepared as per text book of Gunapadam thathu-jeeva vaguppu, indicated for Maradaippu, Nenchu vali, Marppu erichal, Neersurukku, Vellai. I have chosen the above formulate drug for toxicological evaluation as my dissertaion work.

AIM AND OBJECTIVE

AIM

The aim of this study is to evaluate the toxicity study on "***SANGU PARPAM***"

Objective

To collect and purify the raw materials based on literature evidence.

To perform compound analysis for the purified raw drug samples.

To prepare the medicine based on siddha literature evidence.

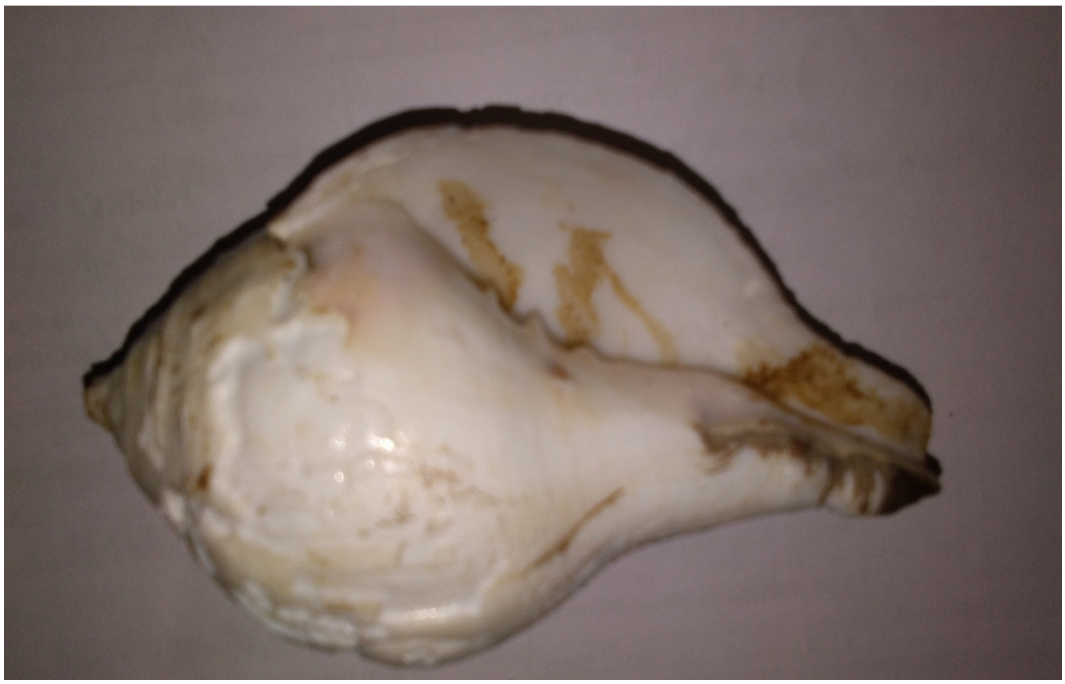
To estimate the presence of chemical constituents by performing elemental analysis.

To analyse its safety, the medicine is subjected for acute oral toxicity evaluation on rodents when the drug is given in single dose through oral administration at various dose levels.

To analyse its safety, the medicine is subjected for repeated oral dose (subacute) toxicity study evaluation on rodents when the drug is given for 28 days.

Turbinella pyrum

சங்கு



SIDDHA LITERATURE REVIEW

சங்கு

சங்கு ஐம்பெரும் கடல்படு திரவியங்களில் ஒன்று என சிறப்பிக்கப்படுகிறது. இப்பூவுலகில் மூன்றில் இரு பகுதியைக் கொண்டிருக்கும் கடல், நமக்கு தரும் செல்வங்கள் கணக்கிலடங்கா. எனினும், சிலவகை பொருட்கள் நம் நாட்டுக்கு பெரும்புகழையும், சிறப்பையும், அந்நிய செலவாணியையும் பெற்று தருவனவாக இருக்கின்றன.

இயற்கையாகவே நமக்கு கிடைக்கும் மூலப்பொருட்களுக்குத் திரவியம் என்று பெயர். தமிழர்கள் இயற்கைப் பொருட்களைக் கடல்படு திரவியம், காடுபடு திரவியம், நாடுபடு திரவியம், மலைபடு திரவியம் என்று அவ்வப்பகுதியில் கிடைத்திடும் சிறப்பான பொருட்களை வகைப்படுத்திப் பிரித்துள்ளனர்.

ஐம்பெரும் திரவியங்கள் என சிறப்பிக்கப்படுபவை.

சங்கு, முத்து, பவளம், உப்பு, ஒக்கோலை இவை கடல்படு திரவியங்களில் வகைப்படுத்தப்பட்டுள்ளன.

தமிழர்கள் ஆழ்கடலில் மூழ்கி சங்கு எடுத்தலையும், முத்து குளித்தலையும் நம் தமிழக மக்கள் பல நூறு ஆண்டுகளுக்கு முன்னரே அறிந்து அதன் வழி பெருமைப் பெற்றவர்களாவார்கள். உலகிலேயே முத்துகளையும், சங்குகளையும் பற்றி முதன்முதலாக அறிந்தவர்கள் தமிழர்கள் எனில் அது மிகையன்று. ஆசிய பகுதிகள் அதிலும் இந்திய பெருங்கடல் பகுதியில் சங்கு வகைகள் அதிகமாக கிடைக்கப் பெறுகிறது.

மனிதன் தன் குழந்தை பருவத்தில் சங்கு பாலாடையில் பால் அருந்துவதில் தொடங்கி, அவனுடைய இறுதி யாத்திரையில் சங்கொலிக்க அடங்குவது வரை, அவனது வாழ்வின் பல நிலைகளில் சங்கு ஒரு சரித்திரம் படைத்திருக்கிறதெனில் அது மிகையில்லை. "சங்கு" நம் தமிழகத்தில் மட்டுமே மிக அதிக அளவில் கிடைக்கக்கூடிய கடல்படு பொருளாகும்.

சங்கு வகைகளை மக்கள் புனிதப் பொருளாகவும், பூசைப் பொருளாகவும், மருந்துப் பொருளாகவும் பயன்படுத்தி வருகின்றனர். சங்கின் நீர் பாவத்தை நீக்க வல்லது அதில் வைக்கப்படும் பால் சந்ததியற்ற பெண்களுக்கு புத்திரப் பேற்றை அளிக்கவல்லது.

போகர் காரசாரத்துறை 60 ல் சங்கு பஞ்சபூத உபரசத்தில் அப்பு பூதக்கூறாக கூறப்பட்டுள்ளது.

"சொல்லக்கே ளுபரசத்தின் புதந் தன்னைச்
சொல்லுகிறோம் பூநாகம் ராச வர்த்தம்
மெல்லக்கே ளப்பிரக மூசிக் காந்தம்
மேலான சிலாசத்தும் பூமி யாச்சு

புல்லக்கேள் நண்டுநத்தை சங்கு முட்டை
பொற்கிளஞ்சி லிவையைந்தும் புனலே யாகும்
கல்லக்கேள் வெள்ளைக்கல் இந்திரகோபம்
கழுதைவண்டு நிமிளையத்தி கனல்கூறாமே".

வேறுபெயர்கள்

கம்பு, கோடு, சங்கு, சங்கம், சுத்தி, சுரிமுகம், நந்து, நாகு, தேவதத்தம், பணிலம், இடம்புரி, வலம்புரி, வளை, வெள்ளை, தரா, வண்டு, வாரணம்.

சட்டமுனி நிகண்டு

கண்டகச் சங்கு, கவரெழு சங்கம், உயன்ற வெலச்சங்கு, உரோமத்தின் சங்கு.

போகர் நிகண்டு -1200

தவளம், திடைநாதம், வளை, வாருதினாதம், வலம்புரி, இடம்புரி, சின்னம், பணிலம், சலம்***புரி, பட்சி, கம்பு, சலஞ்சலம், நீங்காத வோசையோன்.***

"சங்கினுட பேர்தனையே சாற்றக்கேளு
தவள மாந்திசனாதம் வளையமாகும்
வங்கினிட வலம்புரியாமிடம் புரியுமாகும்
வாருதியி னாதந்தான் சின்னமாகும்
நங்கினிட சங்காகும் பணிலம் பாணி
நலமான சலம்புரியும் பட்சிகம்பு
சங்சினிட நீங்காத வோசை யோனாம்
சலஞ்சலாமாஞ் சங்கினிட நாம மாமே"

மங்களமயமான இன்பத்தை விரும்புகின்றவர்களுக்கு விரும்பியதைத் கொடுப்பதால் "கம்பு" என்னும் பெயர் பெற்றது என்பர்.

சங்கு கடல்வாழ் உயிரினமென்பதால் "ஜீவன்" என்ற பெயரும் வடமொழியில் உண்டு.

வகைகள்:

சங்குகளின் சிறந்த வகைகளைக் குறிப்பிடும்பொது தமிழ் நிகண்டுகளும், வடமொழி நூல்களும் அவற்றை இடம்புரி, வலம்புரி, சலஞ்சலம், பாஞ்சசன்னியம் என்று நால்வகைப்படுத்தியுள்ளன.

"இப்பி ஆயிரஞ் சூழ்ந்தது ஒரு இடம்புரியென்றும்
இடம்புரி ஆயிரஞ் சூழ்ந்தது ஒரு வலம்புரியென்றும்
வலம்புரி ஆயிரஞ் சூழ்ந்தது ஒரு சலஞ்சலம் என்றும்
சலஞ்சலம் ஆயிரஞ் சூழ்ந்தது ஒரு பாஞ்ச சன்னியம்"

என்றும் கூறப்படுகின்றது.

1. சலஞ்சலம் (ஓர் சங்கு) a conch shell of super eminent quantities valute syrum.
2. முட்சங்கு – Prickly chank one with thorn like points.
3. பட்டி அல்லது சிறுசங்கு
4. குற்சங்கு, chank containing or Impregnated with pearls.
5. தாழஞ் சங்கு, One with a wide mouth.
6. வலம்புரி சங்கு, One with spiral opening to the right, chank shell of happy convolutions (வழிபாட்டிற்குரிய உன்னதப் பொருள் ஆயுள், செல்வம், மக்கட்பேறு பெருகும்.
7. இடம்புரி சங்கு – Ordinary chank with an opening to the left.
8. பாலாடைச் சங்கு – Small conch used for giving milk to children.
9. உவர்ச்சங்கு
10. நீர்வாழ் சங்கு, conch shell turbinella raps .
11. முள்ளுச்சங்கு
12. பாற்சங்கு, white chank
13. வெண்சங்கு
14. பச்சை சங்கு
15. ஊது சங்கு
16. கிருஷ்ண சங்கு the conch worn by vishnu
17. தீர்த்த சங்கு, sacred conch shell
18. வரிச்சங்கு, striped conch
19. பாஞ்ச சன்னியம், ஓர்வித சங்கு
20. தொணிச்சங்கு
21. கடற்சங்கு, a large convolute shell regarded as religious
22. கண்டகச் சங்கு, a thorny chank in the sacred Gandhaka river near Banaras.
23. கோலசச் சங்கு

பொதுக்குணம்

"கசிவா மிரத்த பித்தங் கண்ணோயக ளேகும்
பசியாறும் வாதம் பறக்கு – மிசிவுடனே
தங்கு முளை விரணந் தானகலு மேவெள்ளைச்
சங்கமது வுண்டாயிற்றான்".

வெண்சங்கினால் இரத்தபித்தம், கண்ணோய்கள், வாத மிகுதி, இசிவு, முளைக்கட்டி முதலியன நீங்கும். பசி உண்டாகும்.

செய்கை

- உடல் உரமாக்கி
- துயரடக்கி
- அகட்டு வாயுகற்றி
- பசித்தீத்தூண்டி
- துவர்ப்பி
- வெப்பகற்றி
- கோழையகற்றி

சுத்தி

ஒரு பொருளில் உள்ள நச்சு தன்மையை நீக்கி அதை மருந்தாகவும், உடலில் சென்று சேர்வதற்கு ஏதுவாகவும் செய்வது சுத்தி முறையாகும்.

சங்கு சுத்தி

கற்சுண்ணாம்பும் உவர்மண்ணும் சமவெடை கூட்டி, எண்மடங்கு நீர் சேர்த்து தெளிவெடுத்து, அதில் சங்கைப் போட்டு எரித்துக் கழுவி எடுக்க சுத்தியாகும்.

பிறசுத்தி முறைகள்

1. ஒரு பலம் சங்கிற்கு 5 பலம் இலைக்கள்ளிச் சாற்றைக் காலையில் விட்டு மாலை வரை வெய்யிலில் உலர்த்தி, மறுநாள் காலையிலும் புதிதாக மேற்படி சாற்றை விட்டு வெய்யிலில் வைக்கவும். இங்ஙனம் மேலும் மூன்றுமுறை செய்து நீர் விட்டு கழுவியெடுக்கச் சுத்தியாகும்.
2. முட்சங்கை பருமான துண்டுகளாகச் செய்து தண்ணீரில் அல்லது இளநீரில் ஆறுமணி நேரம் ஊற வைத்துச் செம்மையாக அலசி அதிலுள்ள மண் முதலியவைகளை நீக்கி விடுவதே சுத்தியாகம்.
3. சங்கை கற்சுண்ணாம்பில் புதைத்து தாளித்து கழுவி எடுக்க சுத்தியாகும்.

சங்கு சேரும் பிற மருந்துகள்

1.சங்கு பற்பம் (பிறமுறைகள்)

தேவையான சரக்குகள்

1. சுத்தித்த செய்த ***சங்கு***
2. உத்தாமணி இலை

செய்முறை

கற்சுண்ணாம்பினால் சுத்திசெய்த சங்கை, உத்தாமணி இலைவிழுதில் புதைத்துக் கனபுடமிடப் பற்பமாகும்.

அளவு

2 குன்றி (260 மி.கிராம்) வரை

துணைமருந்து

நெய்

தீரும்நோய்கள்

இருமல், மூலம், வயிற்றுப்பிணி, அண்ணாக்குத் தூறு, (Enlarged tonsils) மார்பு வலி, வாயு குன்மம்.

2. சங்குபற்பம் (பிறமுறைகள்)

தேவையான சரக்குகள்

1. சுத்தி செய்த ***சங்கு***
2. தாமரை இலை

செய்முறை

சுத்தி செய்த சங்கிற்குத் தாமரை இலை விழுதைப் பூசி ஒருநாள் வெய்யிலில் உலர்த்தி கனபுடமிட்டெடுக்கப் பற்பமாகும்.

அளவு

முத்தினளவு

துணைமருந்து

நெய்

தீரும்நோய்கள்

கண்புகைச்சல், கண் இருள், பித்தம் முதலியன, உடலுக்கு நிறமுண்டாகும்.

இப்பற்பத்தை துளசிச்சாற்றில் கொடுக்க, கபத்தைத் தேடிக்கொண்டிருக்கின்ற சந்தி, தொந்தித்த நாட்பட்ட சுரம் ஆகியன நீங்கும்.

3. சங்கு செந்தூரம்

சங்கு , வெள்ளை வேளைச்சாறு, கற்றாழைச்சாறு இரண்டையும் கொண்டு தனித்தனியாய் அரைத்து முறைப்படி புடமிட்டெடுக்கச் செந்தூரமாம்.

"நத்தை சோணித மாக்கவே
நவின்ற மேற்படி யொன்றிலே
சத்தி குமரி யிரண்டிலே
தருண வரன்முறை தேட்டியே
வித்தை யருமை யறிந்தே செய்
வேத வழியில் நூன்மையாய்
மித்ர பேத மில்லாமல்
வேட்கை யறிந்து செய்வீரே"

செந்தூரத்தினால் தீரும் நோய்கள் துணைமருந்துகளும்

துணைமருந்து	**தீரும்நோய்கள்**
வெள்ளை வேளைச்சாறு	உட்டண மேகம்
சந்தனக்குழம்பு	வாதம்
உள்ளிரசம்	சுவேத சந்தி, பித்தநோய்
சாம்பிராணியிலைச்சாறு	வீக்கப்பாண்டு
எலுமிச்சம்பழரசம்	வெண்குட்டம்
வெல்லம்	குன்ம மதுமேகம்
நாவல்பழரசம்	ரூபவிகாரத் தேமல், மேகம்
இலவங்கப்பட்டைச்சாறு	சந்திதோடக் குளிர்மை

4. சங்கு சுண்ணம்

பெரும் ***சங்கைக்*** கல்லுரலில் இடித்து துணியில் வடிகட்டி எலுமிச்சம் பழச்சாற்றை விட்டு ஒரு சாமம் நேரமரைத்து வில்லை செய்து நன்றாய் உலர்த்தி அகலில் வைத்து மேலோடு மூடி இரண்டு சீலை மண் செய்து கவசத்தின் எடைக்கு 20 பங்கு எடை வறட்டியில் புடமிட்டு ஆறியபின் எடுக்கப்பட்ட சங்கானது சுண்ணமாகி இருக்கும். இதில் மேற்கண்ட எடை நிறுத்து எடுத்துக் கொள்ள வேண்டியது.

சுண்ணத்தை தனியாகவே உபயோகிக்கலாம், இதற்கு பாண்டு, நீர்க்கட்டு, நீர்க்கோவை, மஞ்சள் நோய் ஆகியவை தீரும்.

5. வெள்ளை மாத்திரை

பவழம், பால்துத்தம், சீனாகாரம், பொரித்த துருசு இவைகள் வகைக்கு ஒரு வராகனெடையும் ***சங்கு*** வராகனெடை இருபத்து நான்கும் (100.8 கிராம்) எடுத்து நீர்விட்டுக் கழுவி, உலர்ந்தபின் தூள் செய்து கல்வத்திலிட்டுத் தாய்ப்பால் அரைக்கால்படி (168 மிலி) விட்டரைத்து அதன்பின் இளநீர் கால்படி (336 மி.லிட்டர்) விட்டரைத்து மெழுகுப்பதத்தில் மாத்திரைகளாய்த் திரட்டி உலர்த்திக் கொள்ளவும்.

துணைமருந்துகள்

சுத்தநீர் அல்லது முலைப்பால்

தீரும்நோய்கள்

இரத்தப்படலம் முதலிய கண்ணோய்கள்

குறிப்பு

இம்மாத்திரையை ஓர் ஆண்டு கழித்து உபயோகித்தல் வேண்டும்.

6. சந்திரோதய மாத்திரை

சுத்திசெய்த ***சங்கு*** 2 ½ பலம், இதனை ஒரு வரட்டியின் மீது பரப்பி வைத்து அதன் மீது ஒரு வரட்டியை வைத்து 100 பலம் வரட்டியிற் புடமிட்டு ஆறின பின்னெடுத்துக் கொள்ளவும். இப்படிச் செய்வதால் சங்கு அரை வேக்காடாயிருக்கும். முழு வேக்காடாக வேண்டுமென்பது அவசியமில்லை. கூடுமானால் வேறு எந்த விதமாகிலும் சங்கை அரை வேக்காடாக சுட்டுக் கொள்ள வேண்டியது. இவ்விதம் அரைவேக்காடாகச் சுட்ட சங்கு பற்பம் - 1 பங்கு தூய்மை செய்து உலர்த்திய பொரித்துப் பொடித்த நாட்டு வெண்காரத் தூள் ¼ பங்கு, முலைப்பால் செல்லத்தக்க அளவு.

செய்முறை

முன் கண்ட மூன்று சரக்குகளையும் கல்வத்திலிட்டு முலைப்பாலை சிறுகச்சிறுக வார்த்து ஒரு சாமம் அரைத்து ஒரு குன்றிமணி எடை அளவு மாத்திரைகள் செய்து நிழலிலுலர்த்தி வைத்துக் கொள்ளவும்.

அளவு

1 முதல் 2 மாத்திரை

துணைமருந்து

முலைப்பால், தேன், பன்னீர், கசகசாக் குடிநீர்

தீரும் நோய்கள்

சுரம், இருமல், குழந்தைகளின் நோய், பித்த சம்பந்தமான நோய்.

7. எலிக்கடிக்குக் கோடக சாலை எண்ணெய்

சங்கு	விஷ்ணுகிரந்தி
கோடகசாலை	கோவை
வீழிவேர்	செந்நாயுருவி வேர்
கையாந்தகரை	புங்கம் வேர்
காட்டுமல்லிகை	வெட்பாலை இலை
இலுப்பைவேர்	வெள்வேல்
மூக்கரட்டை வேர்	திருகுகள்ளி வேர்
அமுக்கிராக் கிழங்கு	நொச்சிவேர்
கற்சூரை வேர்	மிளகரணை வேர்
பிரண்டை வேர்	விளா
கொன்னைப்பட்டை	உகாவேர்

திப்பிலி வில்வப்பத்திரி

பூண்டு கோஷ்டம்

செங்கழுநீர்க்கிழங்கு கடுக்காய்த்தோல், சீரகம்

இவைகளை வகைக்கு 1 வராகனெடை (4.2 கிராம்) வீதமெடுத்து நன்றாக இடித்து நல்லெண்ணெயுடன் (3 சேர் / 8.40 கிராம்) கலந்து அடுப்பின் மேலேற்றி எரித்துச் சிவந்த பதத்தில் இறக்கி வடிக்கவும்.

இந்த எண்ணெயில் ஒரு துட்டெடை யெடுத்து உட்கொள்ளவும். எலி கடித்தனாலேற்பட்ட விஷங்கள் தீரும்.

8. நயன ரோகத்திற்கு மாத்திரை

- கடல்நுரை
- ***சங்கு*** (சுட்டது)
- சோழி (சுட்டது)
- மிளகு
- தேற்றான் வித்து (சீவியது)

இவைகளைச் சமமாக எடுத்துப் பேய்க்கருப்பஞ் சாற்றினாலரைத்து மாத்திரையாகத் திரட்டி, நிழலிலுலர்த்தி முலைப்பாலிழைத்து கண்ணிலிட 20 வருடங்கள் சென்ற பூவும் மாறும்.

Phyllanthus amarus

கீழாநெல்லி

கீழாநெல்லி

வேறுபெயர்

- கீழ்க்காய்நெல்லி
- கீழ்வாய் நெல்லி

"தெளிவான யவக்கல் வென்றும் பேரு
திருவாம் பல வென்றதற்குப் பேருண்டாச்சு
கனிவான சங்கணாட்டி வென்றும் பேரு
சார்வான சமந்தாதரி யென்றும் பேரு
கொளிவான கோலவ நீத மென்றும் பேரு
கூர்படை தரை பொன்பட வெலைவஞ்சி யென்றும் பேரு
.....

அவக்கல், திருவாம்பல், சங்கணாட்டி, சமந்தாதிரி, கோலவநீதழ், கூர்படை, தரையொன்படல், எலைஅஞ்சி ஆகியவையும்

கீழா நெல்லியின் பேரைக் கூறக்கேளு
கிளிர்ச்சியான் தமிலகா தமரவீதி
மாழாதமா லந்துமா லினியர் மாதா
மலக்கிசத்து வேலியாகும் பாரு
பேழாக கெடுபுத்திராதா பலாவாய்
பெருமையாம் பூதாத்திரி பெருவிரிய காவாங்
தாழாத காமாலை நிவர்த்தயாகும்
காட்சியால் கீழாநெல்லி கணக்குமாமே.

- பஞ்சகாவிய நிகண்டு 800

தமிலகா, தமரன், மாலந்து, மாலினியர், மாதா என்பவையும் கீழாநெல்லியின் வேறு பெயர்களாகும்.

வகைகள்

- கீழ்க்காய் நெல்லி
- செங்கீழாநெல்லி
- மேல்கீழாநெல்லி
- வட்டுகீழாநெல்லி

வளருமிடம்

இந்தியாவில் வெப்ப நாடுகளில் சதுப்பான எல்லாஇடங்களிலும் வளரும்.

பயன்படும் உறுப்பு

சமூலம்

சுவை

- இனிப்பு
- புளிப்பு
- கைப்பு
- துவர்ப்பு

தன்மை

வெப்பம்

பிரிவு

இனிப்பு

செய்கை

- வீக்கமுருக்கி
- சிறுநீர்பெருக்கி
- துவர்ப்பி
- குளிர்ச்சியுண்டாக்கி

பொதுக்குணம்

சீதமதி பித்தவிடஞ் செவ்விழியின் நோய்க்கூட்டம்
பூதமொடு பேயிரத்தப் போக்குகளும் - பூதலத்துள்
தாழ்வாய்ப் பணித்தேகுப் தப்பாது பொய்யலவே
கீழ்வா யெனு நெல்லிக்கே.
கீழாநெல்லிக்குணத்தான் கேளாய் மதுமேகந்
தாழாக்கா மாலைகளை சண்ணுந்தா – தேழனலுந்
தொக்கினை லுந்தொலைக்குந் தொன்மேகம் போக்கிவிடந்
தக்கவிர ணங்கெடுக்குந் தான்

- *குணபாடம் மூலிகை வகுப்பு*

கீழாநெல்லயினால் வயிற்று மந்தம், தீக்குற்றத்தால் விளைந்த கேடு, கண்ணில் தோன்றும் நோய்க்கூட்டங்கள், குருதிக்கழிச்சல், நீரிழிவு, காமாலை, உடலில் உண்டாகும் வெப்பு, உடலில் தேறிய மேகம், சப்ததாதுகத சுரம், தாதுவெப்பம், நாட்பட்ட மேகப்புண் ஆகிய இவை போகும்.

மேலும் இ.ந்து அசுத்த ரத்தம், விழிநோய், நாவறட்சி, தாகம் இவைகளையும் நீக்கும். வாதத்தைப் பெருக்கச் செய்யும்.

கீழாநெல்லி சேரும் பிற மருந்துகள்

1.பஞ்ச கௌவியக் கிருதம்

பசுவின்பால்

நெய்

கோநீர்

தயிர்

சாணம் - வகைக்கு படி 2 (2.6 லிட்டர்)

அதிமதுரம்	சிறுதேக்கு
கோஷ்டம்	இந்துப்பு
வாய்விளங்கம்	தனியா
விழலரிசி	வாலுழுவையரிசி
வெட்பாலைஅரிசி	வசம்பு
வெள்ளுள்ளி	தேவதாரு
சதகுப்பை	சிற்றரத்தை
சந்தனம்	கருஞ்சீரகம்
கருவாப்பட்டை	நன்னாரிவேர்
பொன்முசுட்டை	நெல்லிமரவேர்
சாரணைவேர்	***கீழாநெல்லி***
நிலப்பனைக்கிழங்கு	துத்திவேர்
குரோசாணி ஓமம்	பெருகுருப்பை
அதிவிடயம்	சாதிக்காய்
இலவங்கப்பத்திரி	திரிகடுகு
வில்வவேர் சாம்பல்	கடுக்காய்
தான்றிக்காய்	நெல்லிவற்றல்

- வகைக்கு கழஞ்சு 1 (5.1 கிராம்)

முதலில் இரண்டு படி (2-6லி) அளவு பசுவின் சாணத்தில் 2 படியளவு அதன் சிறுநீரை விட்டு கரைத்துப் பிசைந்து வடிகட்டி பால், தயிர், நெய் இம்மூன்றையும் கூட்டி ஒரு கிருத பாண்டத்தில் வைத்துக் கொள்க. அப்பால் 2வது அங்கத்தில் குறிப்பிட்ட 36 சரக்குகளையும் நன்கு உலர்த்தி இடித்துத் சூரணித்துப் பசுவின்பால் விட்டு நன்கு அரைத்து முன்சுத்தப்படுத்தி வைத்துள்ள கிருதபாண்டத்தில் போட்டுக் கரைத்து அடுப்பிலேற்றி தினம் சிறுதீயாக ¼ - ½ (6-12 நிமிடம்) சாமம் எரித்து அடுப்போடு வைத்து விடுக. இப்படி 2 நாள் எரித்து 3வது நாள் பதமுறக் காய்ச்சி வடிகட்டி வைத்துக் கொள்ளவும்.

அளவு

வேளைக்கு 1-2 தேக்கரண்டி (4-8 மிலி) அளவு தினம் 2 வேளை கொடுத்து வருக.

தீரும்நோய்கள்

பெரும்பாடு, குன்மம், பீநிசம், காமாலை, பெருவயிறு, பாண்டு

பத்தியம்

புளிப்பு, கைப்பு நீக்கி இச்சாபத்தியம் நன்று.

- ***கண்ணுசாமி பரம்பரை வைத்தியம் பக்.251***

2.காமாலை கியாழம்

கீழாநெல்லி

கரிசலாங்கண்ணி

பேய்ப்புடல்

வெண்மிளகு

சோம்பு

வில்வவேர்

வகைக்கு பலம் ¼ (10.2கி) வீதம் இடித்து ஒரு குடுவையில் போட்டு ½ படி (650மிலி) சலம் விட்டு ¼ படியாக (325 மிலி) சுண்டக் காய்ச்சி வடிகட்டி வேளைக்கு 1 அவுன்ஸ் (30மிலி) வீதம் 3 வேளை உட்கொள்ளவும். இப்படி 3-5 நாள் உட்கொள்ள பாண்டு, சோகை, காமாலை முதலிய ரோகங்கள் போம்.

- ***பதார்த்த குணசிந்தாமணி மூலவர்க்கம் பக்-251***

கலிக்க மாத்திரை

ஓடுகுஞ் சன்னி மூர்ச்சை யொடு
உள்ளே சுவாச மோடிவிடில்
ஓடுங்கோல் கலிக்கம் நயனத்தி
லெல்லா வியாதி விடங்க ளுக்கும்
தடுங்கும் விரிச்சான் கொம்மட்டி
*தகரை விரையுங் **கீழ்வித்தும்***
விடுங்கோல் மிளகு துரிசு துத்தம்
வெள்ளி விரையும் சீனி மிட்டே.
இட்டே யரைக்க பேய்ப்பீர்க்க
னிலையாம் வல்லிச் சாற றைத்து
கட்டே குளிகை நிழலு லர்த்தி
கண்ணி விடும் நேரமதில்
தட்டே குளிகை யொன்றே டுத்து
சற்றே யுப்புங் குப்பை மேனி

விட்டே கசக்கி கண்ணிலிட

விண்ணில் போன வுயிர்மீளும்.

- ***அகத்தியர் வைத்திய காண்டம் ப.எண். 90***

தேவையான சரக்குகள்

1. கொம்மட்டி விதை
2. தகரை விதை
3. ***கீழ்காய் நெல்லி*** விதை
4. மிளகு
5. துரிசு (சுத்தித்தது)
6. துத்தம் (சுத்தித்து)
7. வெள்ளரி விதை
8. சீனி — சமஅளவு
9. பேய்பீர்க்கு இலைச்சாறு
10. பிரண்டைச்சாறு — தேவையான அளவு

செய்முறை

எண் 1 முதல் 8 வரையுள்ள சரக்குகளை ஒன்றாய் சேர்த்து கல்வத்திலிட்டு, பேய்ப்பீர்க்கு இலைச்சாறு மற்றும் பிரண்டைச்சாற்றால் அரைத்து மாத்திரை செய்து நிழலில் உலர்த்தி வைக்கவும்.

பயன்படுத்தும் முறை

சிறிதளவு உப்பு சேர்த்துப் பிழிந்த குப்பைமேனி சாற்றில் மாத்திரையை இழைத்துக் கண்ணிவிடவும்.

தீரும் நோய்

சன்னி நோயால் ஏற்படும் மூர்ச்சை தீரும்.

4. நாகரச பற்பம்

தேவையான சரக்குகள்

1. நாகம் சுத்தித்தது – 35 கிராம்
2. ***கீழாநெல்லி*** சமூலம் சிறு துண்டுகளாக நறுக்கியது.
3. பனைமட்டை குருத்துச் சாறு
4. இரசம் சுத்தித்தது.

செய்முறை

நாகத்தை இரும்புக்கடாயில் இட்டு கன்னான் உலையில் வைத்து உருக்கி, சிறுதுண்டுகளாக நறுக்கி வைத்திருக்கும் கீழ்க்காய் நெல்லி சமூலத்தை சிறிதளவு தூவி கரண்டியால் தேய்க்காமல் நாகத்தைக் கிளறி விடவும். மீண்டும் துருத்தியை

விசையாக ஊதி, மீதமுள்ள துண்டுகளைத் தூவி, கிளறிக்கொடுக்கப்பற்றி எரிந்து பூக்கும். இதனை மெல்லிய சீலையில் வஸ்திரகாயம் செய்து திப்பிகளைத் தள்ளி, பூத்திருப்பதைக் கல்வத்திலிட்டு, அந்த எடைக்கு இரசம் சேர்த்து பனைமட்டைக் குருத்துச் சாற்றால் பன்னிரெண்டு மணி நேரம் அரைத்து வில்லைத் தட்டிக் காயவைத்து ஓட்டிலிட்டு சீலைமண் செய்து, காய்ந்த பின் பத்து அல்லது பதினைந்து வரட்டியில் புடமிட்டு எடுத்து, அரைத்து வைத்துக் கொள்ளவும்.

அளவு

30-50 மி.கிராம் , 2 வேளை

அனுபானம்

பசுநெய் அல்லது பசுவெண்ணெய்

பத்தியம்

இச்சாபத்தியம்

தீரும் நோய்கள்

மூலநோய்கள், பவுத்திர நோய்கள், வெள்ளை, மேகவிரணம்.

- சிகிச்சாரத்நீதீபம், பாகம் - II பக்கம்எண்.214

5. கீழாநெல்லி குடிநீர்

தேவையான பொருட்கள்:

1. ***கீழாநெல்லிச*** சமூலம்
2. மஞ்சள்கரிசாலை
3. வெள்ளாட்டு புழுக்கை
4. ஆமணக்கு வேர்
5. சுக்கு
6. முடக்கற்றான் வேர்

செய்முறை:

மேற்சொல்லப்பட்ட ஆறு பொருட்களையும் வகைக்கு ஒரு கழஞ்சு (5 கிராம்) வீதம் எடுத்தக் குடிநீர் செய்து காலை, மாலை இருவேளையும் புகட்டி வர மஞ்சட்காமாலை தீரும்.

பத்தியம்:

பாலும் சோறு

குணத்தொடு ***கீழா நெல்லி***

கூறபொற் றலைக்கை யானு

மணத்தவெள் ளாட்டு லத்தி

வளர்ந்தவா மணக்கு சுக்கு

பணைத்திடு முடக்கற்றானும்
பாகமாய்க் குடிநீர் கொண்டால்
இணைத்தமஞ் சட்கா மாலை
யேரும்பா லன்னங் கொள்ளே

6. கீழாநெல்லி எண்ணெய்

தேவையான சரக்குகள்:

1. ஆமணக்கு நெய் ஒரு படி (1.3லி)
2. பசும்பால் ஒரு படி
3. ***கீழாநெல்லிச்*** சாறு அரைக்கால் படி (160 லிட்)
4. அதிமதுரம்
5. விட்ணு கிராந்திவேர்
6. கடுக்காய்த் தோல்
7. தான்றிக்காய் தோல்
8. துளசியிலை
9. தூதுவளை வேர்
10. பசரைக்கீரை
11. தோல் சீவின சுக்கு
12. இளநீர்

செய்முறை:

ஒரு படி ஆமணக்கு நெய், ஒரு படி பசும்பால், ஆழாக்கு 160 மி.லி கீழாநெல்லிச்சாறு, ஆகிய இம்மூன்றையும் ஒரு மண் சட்டியில் ஊற்ற வேண்டும். அதிமதுரம், விட்ணுகிராந்திவேர், கடுக்காய்த்தோல், தான்றிக்காய் தோல், தோல் சீவின சுக்கு, துளசியிலை, தூதுவளை வேர், பசரைக்கீரை ஆகிய இவ்வெட்டுப் பொருள்களையும் வகைக்கு ஒரு பல் வீதம் எடுத்து, அதில் போதுமான இளநீர் விட்டரைத்து மேற்சொன்ன எண்ணெயுடன் கூட்டிக் கலந்து எரித்துப் பக்குவமாக வடித்து எடுக்க வேண்டும்.

பயன்

அதை இரவு உணவிற்குப்பின் ஒரு உச்சிக்கரண்டியளவு கொடுத்து உறங்கச் செய்ய வேண்டும் அப்படிச் செய்ய காலையில் பேதியாகும் அதனால் இருமல், கணம், எலும்பைப்பற்றிய சுரம், உட்சுரம், வயிற்றுக்கடுப்பு, வரட்கணம், மூலக்கணம் முதலிய நோய்கள் நீங்கும்.

7. கீழாநெல்லிப்பால்

தேவையான சரக்குகள்:

1. ***கீழாநெல்லி*** வேர்ப்பட்டை
2. கறிவேப்பிலை
3. சீரகம்
4. பச்சை நெல்லுமி
5. தாய்ப்பால்
6. மிளகு

கீழாநெல்லி வேர்ப்பட்டை, கறிவேப்பிலை, சீரகம், பச்சை நெல்லுமி, இந்நான்கு சரக்குகளையும் வகைக்கு ஒரு வராகனெடை (4.2கிராம்) எடுத்து இடித்து அதை தாய்ப்பாலில் போட்டு ஓரிரவு முழுவதும் ஊறவைத்து மறுநாள் காலை அரைத்துப் பிழிந்து கொடுக்க வேண்டும். காலையில் மட்டும் மூன்று நாட்களுக்கு இதைக் கொடுக்க வேண்டும்.

மாலையில் பத்து மிளகைச் சாம்பலாக்கி, சீரகம் அரை வராகனெடை (2கிராம்) எடுத்துப் பொரியலிட்டு 80 மி.லி. நீர் விட்டு இரண்டு கொதி வந்தவுடன் வடிகட்டி கொடுக்க வேண்டும். இவ்விதம் செய்து வர கணநோய் குணமாகும்.

வழக்குமுறைகள்

இளங்கொழுந்தைக் குடிநீரிட்டுச் சீதக் கழிச்சலுக்குக் கொடுக்கலாம்.

இலையை உப்பு சேர்த்தரைத்துச் சொறி, சிரங்குகளுக்கு பூச இவை போகும்.

இலையை அரைத்து தசைச் சிதைவுக்கு பற்றிடலாம்.

இப்பூண்டின் இலையையும் வேரும் நீங்கலாக, மற்ற தண்டுகளை எடுத்துச் சாறு பிழிந்து விளக்கெண்ணெயில் கலந்து கண்காச நோயுடையோர்க்குக் கண்ணில் விடவும்.

இலையையும் வேரையும் உலர்த்தி பொடித்து, கழுநீரில் குழைத்து புண்புரைகளுக்கும் வீக்கங்களுக்கும் பூசலாம்.

இலையையும் வேரையும் குடிநீரிட்டு சுரங்களுக்குச் சூட்டோடே கொடுக்க காய்ச்சல் தணியும்.

இதனையே ஆறியபிறகு குடித்து வர உடல் வலுக்கும். இது பசித்தீயை தூண்டும்.

இலை, வேர் முதலியவற்றை அரைத்து மோரில் கலக்கிக் கொடுத்துவரின், மஞ்சட்காமாலை, மேகநோய் இவைகள் போம். உப்பு நீக்கவும்.

வேரைக்கழுநீரில் அரைத்துக் கலக்கிப் பெரும்பாட்டிற்குக் கொடுக்க சுகமாகும்.

வேரைப் பச்சையாய் 17 கிராம் எடுத்து அரைத்து, பாலில் கலக்கிக் கொடுக்க காமாலை நோய் நீங்கும்.

MODERN ASPECT

CONCH SHELL

Man has close relation with mollusca since prehistoric times. The mysterious creation of the nature from marine source fascinated man and with time the man attributed magical and mythical powers to shells and started crafting monuments. The excavation of stone age cultures found to contain heaps of discarded shells in kitchen. There exists evidence for the shell trade between prehistoric Iran and southern Asia.

A large number of molluscs species are found in India. Molluscs constitute an important component of marine biodiversity of India. It is estimated that number of molluscs species varies between 80,000 and 1,00,000. There are five kinds of molluscs species found in India. Out of 586 families found in the world, 279 families were present in India.

Among the molluscs, chanks is the most important species. Chanks are commercial importance due to their varied and unique structure, large size and glittering surface when polished.

The history of chank can be dates back to Indus valley civilization. Chank ornaments were also found in excavations of Mohenjadaro and Harapa. According to Tamil literature, chank cutting industry existed 2000 years ago. Though it declined in TamilNadu. it is still a flourishing industry in west Bengal, orissa and Bangladesh.

They are used as ornaments like bangles, rings, necklace and variety of shell crafts. They are also used amulet against evil eye.

Chank blowing is usual custom to announce auspicious, religious and sacred events also to last rites. It is blown to invocate God at the time of worship. Water poured from a chank is considered as 'holy' according to Hindu religion.

VERNACULAR NAMES

Tamil	:	Sangu, sankas
English	:	Conch shell, conch
Sanskrit	:	Shankha
Bengali	:	Sankh
Telugu :	:	Sankhamu
Kannada	:	Shankha
Hindi	:	Shanke
Malayalam	:	Sangu

Zoological classification

Kingdom	:	Animalia
Phylum	:	Mollusca
Class	:	Gastropoda
Family	:	Turbinellidae
Sub family	:	Turbinellinae
Genus	:	Turbinella
Species	:	pyrum

Morphology of chank

Chanks has a large, massive, elegant shell with a fine pear shaped spire and a wide opening or mouth which is prolonged into a narrow spout.

Chanks has an external lustrus yellowish brown horny layer and beneath it a thick layer, chiefly formed of calcium salts.

Valampuri chank

Chanks are characterized by large shells with fine texture and are highly valued. Normally, the chanks shell are formed in a dextral spiral; occasionally shells with a sinistral spiral are also formed. This peculiar type of chank is called "valampuri chank'. These have a high value and very rarely caught, almost one in a lakh.

A sinistral chank is very rare and considered very auspicious and deeply venerated by Hindus.

Busycon contratrium is found very common in gulf of mexico and west florida is imported to India and sold as sacred chank at higher cost.

Action

- Nutrient
- Anodyne
- Carminative
- Stomachic
- Astringent
- Febrifuge
- Expectorant

Uses of chank

Therapeutic benefits

The shells were used to cure many ailments in many countries for years together.

a. A remedy for pimples and other skin troubles on the face and body.
b. Internally given for acute form of dyspepsia.
c. Shooting pain and inflammatory condition in the joints.
d. Shell grit is used in production of dental cream, talcum powder, carbide industry.
e. Chank powder is a panacea for many illnesses like jaundice, general debility, cough.
f. Dried visceral mass is efficient in enlargement of spleen.
g. Incase of Rickets, chank powder mixed with water is rubbed on the breasts.
h. Given for asthma, cough, constipation
i. Used in head ache, general debility and eye diseases.

   Industries like national Institute of oceanography like goa, central drug research Institute in lucknow. Bose Institute of oceanography in kolkata are concered with development of marine medicinal products.

   - *(Krishnamoorthy K.Sanga illakiyathil sangu, Unnamalai publication, chidabaran).*

Apart from the above medicinal uses, chanks are also made in bangles, bracelets, rings etc,. These are some of the zoological aspect and uses of the ancient people.

KEEZHANELLI

Botanical name

Phyllanthus amarus

Classification

Kingdom	-	Plantae
Division	-	Angiosperm
Class	-	Dicotyledons
Sub-class	-	Monochlamydeae
Series	-	Unisexuales
Family	-	Euphorbiaceae
Genus	-	Phyllanthus
Species	-	amarus

Regional and Other Names

Bengali	-	Bhui amla
English	-	Country gooseberry
Gujarati	-	Bhonyaanmali
Hindi	-	Jarmla, bhonyabali
Kannada	-	Nela nelli
Malayalam	-	Kirganellia
Marathi	-	Bhuiavali
Sanskrit	-	Bhudhatri
Tamil	-	Kilanelli
Telugu	-	Nela usivika

Habitat

Perennial erect herb

Distribution

It is chiefly distributed in tropical and subtropical regions of the world except australia.

Habit & Features

A herb upto 60cm in height occuring as a winter weed. Stem angular, leaves distichous elliptic oblong or linear oblong, flower axillary, yellowish, greenish or whitish male flowers 1-3 female solitary; capsules 2.5mm diameter depressed – globose, smooth, sarcely lobed, seeds 3 gonous, pale brown, longitudinally ribbed.

Morphology

Stem

Stem often branched at the base angular leaf bearing branch lets-slendes spreading.

Leaves

Leaves closely arranged upto 1.5x0.6cm, obtuse or retuse at apex, petiole 1.5cm stipules lanceolate 1mm.

Flowers

Flowers are yellowish green in minute cymules, pendant from the axils of leaves.

Male flower

Tepals 5 to 6, obovate, stamens 3, anthers sessile on the short column, filaments connate.

Female flower

Tepals much shorter than capsule, 1.2mm long, style 3, capsule oblate, smooth.

Seeds

Seeds 1.5mm long, 6 in number, blackish, concentrically striate.

Chemical constituents

The major chemical constituent are lignans diaryl butane, phyllanthin and aryl tetrahydronapthelene, hypophyllanthin.

Ent-norsecuriniae, seco-4-hydroxylintetralin, seco-isolariciresmol-trimethyl ether, hydroxyni anthin seed contains oil which contains-linoteic & linolenic acid.

The chemical constituents are

Chemical	Part
3, 5, 7- Trihydroxy flavonal 4-0-Alpha-L-(-)- Rhamnopyranoside	Root
4-Methoxy-Norsecurinine	Plant
4-Methoxy – securinine	Plant
5,3',4'-Trihydroxy flavanone-7-0-Alpha-(-) Rhamnopyranoside	Root
Astragalin	Plant
Brevifolin-carboxylic acid	Plant
Cymene	Leaf
Hypophyllanthine	Plant
Limonene	Leaf
Lintetralin	Plant
Lupa-20(29)-ENE-3-β-01	Root
Lupa -20(29)-ENE-3-Beta-OL-acetate	Root
Lupeol	Root
Methyl-salicylate	Plant
Niranthin	Leaf
Nirtetralin	Leaf
Niruretin	Plant
Nirurin	Plant
Phyllanthin	Leaf
Phyllochrysine	Plant
Phyltetralin	Leaf
Quercetin	Plant
Quercetin-Heteroside	Plant
Quercetol	Plant
Quercitrin	Plant
Rutin	Plant
Saponins	Plant

Properties and medicinal uses

The herb is bitter in taste and posses astringent, deobstruent, stomachic, diuretic and febrifuge.

It is used in stomach disorders like diarrhoea, dysentery, dyspepsia, colic also used in dropsy and diseases of urogenital system. Fresh roots given in jaundice, also used as galactagogue.

In Rajasthan the roots are used for treating camels suffering from digestive troubles. A decoction of the leaves is used as refrigerant for the scalp. Leaves and roots are made into a poultice with rice water for application on edematous swelling and ulcers. The later is also applied to offensive sores and ulcers and mixed with oil, it is used in ophthalmia

- The wealth of India part VII

(Pageno-56)

Chenca pidera is the spanish name for keezhanelli which means 'stone Breaker' or shatter stone". It is called stone breaker because it is used for dissolve gallstones and renal stones and for other kidney problems by the people of amazon.

In south america, it is still used for galls stones and renal stones.

In peru, it is used for hepatitis, urinary infections as a diuretic.

In Brazil keezhanelli is called as quebra pedra and is considered as excellent medicine to remove uric acid from the urine and to eliminate stones. It is also used to mitigate urinary bladder infections and blockages, liver ailments, joint pain, cystitis and diabetes.

In India, whole plant used for jaundice, diabetes, diseases of pitha, urinary disorders, skin diseases, menorrhagia, vomiting anemia, cough, asthma, bronchitis.

Ethno medicinal uses

Root - Abortifacient (Tarafder, 1983)
Jaundice (Mishra & Sahu, 1984)

Leaf - Allergy (Bhalla, et.al, 1982)
Gonorrhoea (Mishra & Sahu, 1984)
Dysentery (Banerjee, 1977)
Jaundice (Sharma, et al, 1977)

Stem - Dysentery (Mishra & Sahu, 1984)

Whole plant- Jaundice (Nagedra prasad & Abraham, 1984)

Dropsy & gonorrhoea (Mishra & Sahu, 1984)

Ulcer, dysentery (Rajwar, 1983)

Boils (Maheswari, et.al, 1980)

The plant also have pharmacological activity like hepato protective activity, anti hepatitis B surface antigen. Anti HIV activity, hypoglycemic activity, antispasmodic activity, analgesic activity, antimicrobial activity.

A significant hepatoprotective activity is exhibited by the hexane extract of dried aerial part at a concentration of 1 mg/ml. This plant posses potent hepato protective effect against toxin induced liver damage.

The extract of phyllanthus amarus inhibits endogenous DNA polymerase of hepatitis B virus and binds to surface antigen of hepatitis B virus. Acute and chronic infection significantly controlled. There are indication that an extract may help in interrupting HBV carrier state.

The extract of phyllanthus amarus is known to inhibit human immunodeficiency virus type I reverse transcriptase. HIV activity inhibitor is identified as repadnusinic acid.

An aqueous extract of phyllathus amarus is known to produce hypoglycemic action in normal as well as allacon-induced diabetes mellitus.

Alkaloids from P.amarus exhibits a selective antispasmodic activity on the ileum which is equivalent to papaverine. The antispasmodic activity is due to the antagonism of calcium entry into the cell. This smooth muscle relaxant activity within the urinary a billiary tract may facillitate the expulsion of kidney and bladder stones.

Methanolic extract from callus of plant is known to produce pain relieving activity.

Water extract of fresh entire plant at a concentration of 1% doesnot exhibit any activity against neisseria gonorrhoea. The saline extract exhibits antibacterial activity on pasterulla pestis and staphylococcus aureus. petroleum ether extract of whole plant shows antifungal activity against helminthosporium sativa.

The leaf extract is known to exhibit an antifungal effect against alternaria alternata.

PUDAM

SANGU PARPAM

MATERIALS AND METHODS

Selection of Drug

'***SANGU PARPAM***' as mentioned in the text Gunapadam thathu jeeva vaguppu (page number 646) was choosen.

Ingredients

Purified sangu (*Turbinella pyrum*)

Keelanelli juice (*Phyllanthus amarus*)

The sangu was purchased from Fishermen of Tiruchendur Seashore and authenticated by Dr. N. Chandrasekar, Rtd. HOD, Department of Geology and Marine Technology, Manonmaniam Sundaranar University, Tirunelveli. Keezhanelli plant was collected from Palayamkottai, Moolikulam region and authenticated by Dr.S.Sudha, HOD, Dept. of Medicinal Botany, Government Siddha Medical College, Palayamkottai.

Method of purification

Equal weight of limestone and uvarman was mixed with water. By leaving the sediments, filtrate water are taken. Sangu (conch shell) was immersed in it. Then it is boiled until water is fully evapourated. Then sangu is washed with water and then dried.

Method of Preparation

Purified conch shell (Sangu) is broken into pieces and soaked in juice of Keezhanelli for three days. Then it is put into a mud saucer again Keezhanelli juice is added and closed with another mud saucer and sealed with mud cloth and dried. Then it is cupellated with fifty cow dung cakes to get parpam.

Dose

½ (244mg) to 1 panavadai (488mg) twice a day

Adjuvant:

Butter or Lemon juice

Indication:

Maradaippu

Nenchu vali

Marppu eruchal

Neerchurukku

Vellai

QUALITATIVE AND QUANTITATIVE ANALYSIS
PHYSICOCHEMICAL ANALYSIS

Sample Description	:	***SANGU PARPAM***
Equipment used	:	Atomic Absorption Spectrometer (AAS)

Colour:

About 50gm of ***SANGU PARPAM*** was taken in a clean glass beaker and tested for its colour by viewing again a water opaque background under direct sunlight.

pH:

The pH of ***SANGU PARPAM*** was estimated as per the method prescribed in Indian Standard (IS) – 6940 (1982). One gram of the ***SANGU PARPAM*** was taken into a 100ml graduated cylinder containing about 50ml of water and filled up to the mark with water. The cylinder was stopped and shaken vigorously for two minutes and the suspension was allowed to settle for an hour at 25^0 to $27^{0.}$ About 25ml of the clear aqueous solution was transferred into a 50ml breaker and tested for pH using DIGISUN digital pH meter (DIGISUN Electronics, Hyderabad, India)

Determination of Ash Value:

Weighed accurately 2 grams of ***SANGU PARPAM*** in tarred platinum or silica dish and incinerate at a temperature not be exceeding 450^0C until free from carbon, cooled and weighed. Calculate the percentage of ash with reference to the air dried drug.

Water Soluble Ash:

To the gooch crucible containing to the total ash, added 25ml of water and boiled for 5 minutes. Collected the insoluble matter in a sintered glass crucible or on ash less filter paper. Wash with hot water and ignite in a crucible for 15 minutes at a temperature nor exceeding 450^0 C subtract the weight of the insoluble matter from the weight of the ash the difference of the weight represents the water soluble ash. Calculate the percentage of water soluble ash with reference to the air dried drug.

Acid Insoluble Ash:

Boiled the ash 5 minutes with 25ml of 1:1 dil HCL. Collect the insoluble matter in gooch crucible on an ash less filter paper wash with hot water and ignite. Cooled in a desiccators and weighted calculated the percentage of acid insoluble ash with reference to the air dried drug.

Loss on Drying:

Five grams of ***SANGU PARPAM*** is heated in a hot oven at 105^0C to constant weight and the percentage of loss of weight has calculated there from.

FOURIER TRANSFORM – INFRA RED SPECTROSCOPY

PERKIN ELMER – SPECFTRUM ONE

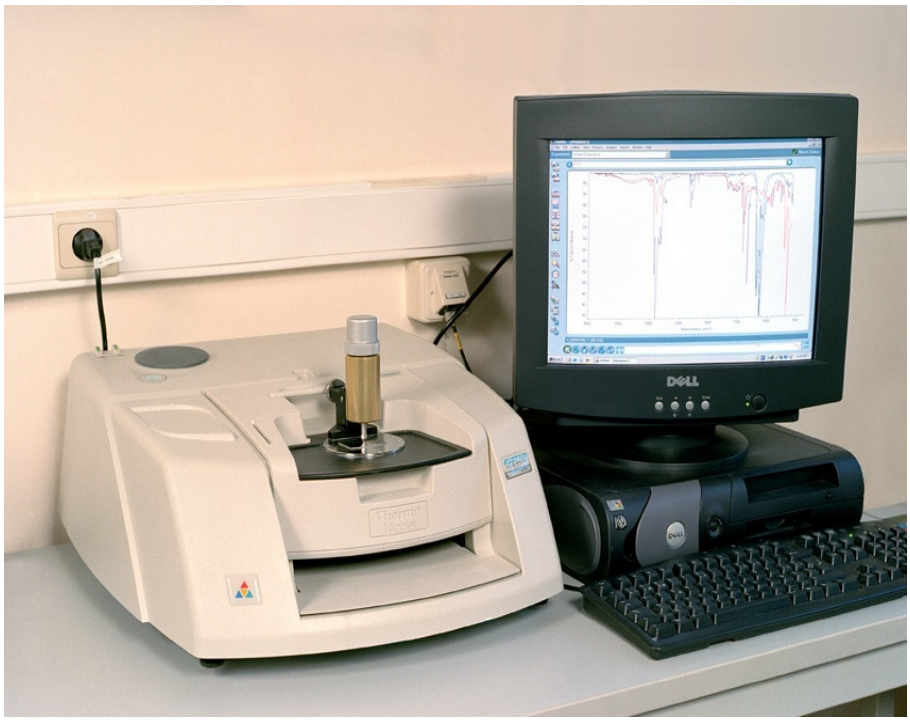
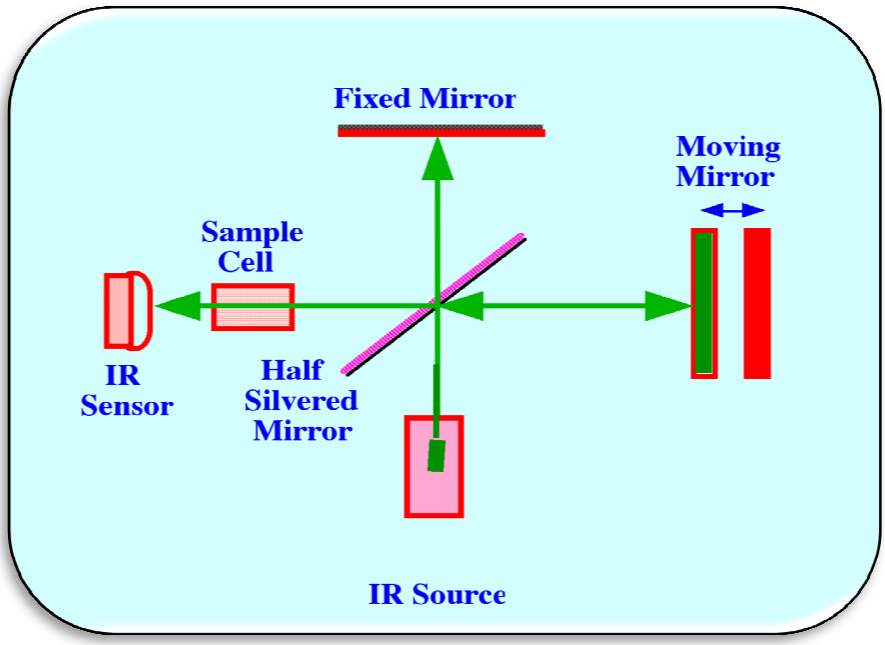


Fig. 3: FTIR Apparatus

FTIR-Mechanism



FOURIER TRANSFORM – INFRA RED SPECTROSCOPY

PERKIN ELMER – SPECFTRUM ONE

Introduction

Vibrational spectroscopy is an extremely useful tool in the elucidations of molecular structure. The spectral bands can be assigned to different vibrational modes of the molecule. The various functional groups present in the molecule can be assigned by a comparison of the spectra with characteristic functional group frequencies. As the positions of the bands are directly related to the strength of the chemical bond, a large number of investigations including intermolecular interactions, phase transitions and chemical kinetics can be carried out using this branch of spectroscopy.

In IR spectroscopy, the resonance absorption in made possible by the change in dipole moment accompanying the vibrational transition. The infrared spectrum originates from the vibrational motion of the molecule. The vibrational frequencies are a kind of fingerprint of the compounds. This property is used for characterization organic, inorganic and biological compounds. The band intensities are proportional to the concentration of the compound and hence qualitative estimations are possible. The IR spectroscopy is carried out by using Fourier transform technique.

Principle

Infra red spectroscopy involves study of the interaction of electromagnetic radiation with matter. Due to this interaction,l electromagnetic radiation characteristic of the interacting system may be absorbed (or emitted). The experimental data consist of the nature (frequency of wave length) and the amount (intensity) of the characteristic radiation absorbed or emitted. These data are correlated with the molecurlar and electronic structure of the substance and with intra – and inter molecular interactions.

FT-IR spectroscopy is used primarily for qualitative and quantitative analysis of organic compounds, and also for determining the chemical structure of inorganic materials. The region between 500-4000 wave number is referred to as the finger print region. Absorption bands in this region are generally due to intra molecular phenomena and are highly specific for each material. The specificity if these bands allow computerized data searches to be performed against reference libraries to identify a material.

Table of Characteristic IR Absorptions

Frequency, cm-1	**Bond**	**Functional group**
3640 - 3610 (s, sh)	O-H stretch	Free hydroxyl alcohols phenols
3500 - 3200 (s,b)	O-H stretch, H – bonded	Alcohols, phenols
3400 – 3250 (m)	N – H stretch	Primary, secondary, amines, amides
3300 – 2500 (m)	O – H stretch	Carboxylic acids
3330 - 3270 (n, s)	–C (triple bond) C – H : C - H stretch	Alkynes (terminal)
3100 – 3000 (s)	C – H stretch	Aromatics
3100 – 3000 (m)	= C – H stretch	Alkenes
3000 – 2850 (m)	C – H stretch	Alkenes
2830 – 2695 (m)	H – C = 0; C –H stretch	Aldehydes
2260 - 2210 (v)	C (triple bond) N stretch	Nitriles
2260 – 2100 (w)	C (triple bond) C- stretch	Alkynes
1760 – 1665 (s)	C = 0 stretch	Carbonyls (general)
1760 – 1690 (s)	C = 0 stretch	Carboxylic acids
1750- 1735 (s)	C = 0 stretch	Esters, saturated aliphatic
1740 – 1720 (s)	C = 0 stretch	Aldehydes, saturated aliphatic
1730 – 1715 (a)	C = 0 stretch	Alpha, beta – unsaturated esters
1715 (s)	C = 0 stretch	Ketones, saturated aliphatic
1710 – 1665 (s)	C = 0 stretch	Alpha, beta – unsaturat aldehydes, ketones
1680 – 1640 (m)	-C = C -	Alkenes
1650 – 1580 (m)	N – H bend	Primary amines
1600 – 1585 (m)	C-C stretch (in – ring)	Aromatics
1550 – 1475 (s)	N – 0 asymmetric stretch	Nitro compounds
1500 – 1400 (m)	C –C stretch (in – ring)	Aromatics
1470 – 1450 (m)	N – 0 asymmetric stretch	Nitro compounds
1370 – 1350 (m)	C – H bend	Alkanes
1360 – 1290 (m)	C – H rock	Alkanes

1335 – 1250 (s)	C – N stretch	Aromatic amines
1320 – 1000 (s)	C – 0 stretch	Alcohols, carboxylic acids, esters, ethers
1300 – 1150 (m)	C – H wag (- CH2X)	Alkyl halides
1250 – 1020 (m)	C – N stretch	Aliphatic amines
1000 – 650 (s)	=C – H bend	Alkynes
950 – 910 (m)	O – H bend	Carboxylic acids
910 – 665 (s, b)	N – H wag	Primary, secondary amines
900 – 675 (s)	C – H "oop"	Aromatics
850 – 550 (m)	C – CI stretch	Alkyl halides
725 – 720 (m)	- C (triple bond) C-H : C- H bend	Alkynes
690 – 515 (m)	C - Br stretch	Alkyl halides

M = medium, w = weak, s=strong, n = narrow, b = broad, sh = sharp

Sampling techniques:

There are a variety of techniques for sample preparation depending on the physical form of the sample to be analyzed.

Solid : KBr or Nujol mull method

Liquid : CsI / TIBr Cells

Gas : Gas Cells

Experimental Procedure: Done at SAIF, IIT Madras, Chennai – 36KBr Method

- The Sample was grounded using – an agate mortar and pestle to give a very fine powder.
- The finely powder sample was mixed with about 100 mg dried KBr salt.
- The mixture was then pressed under hydraulic press using a dye to yield a transparent disc (measure about 13 mm diameter and 0.3mm in thickness), through which the beam of spectrometer passed.

HR SEM - METHODOLOGY

HR SEM-Methodology:

An SEM is essentially a high magnification microscope, which used a focused scanned collection beam to produce images of the sample, both top-down and, with the necessary sample preparation, cross-sections. The primary electron beam interacts with the sample in a number of key ways:-

Primary electrons generate low energy secondary electrons, which tend to emphasize the topographic nature of the specimen.

Primary electrons can be backscattered which produces images with a high degree of atomic number (Z) contrast.

Ionized atoms can relax by electron shell-to-shell transitions. Which lead to either X-ray emission or Auger electron ejection. The X-rays emitted are characteristic of the elements in the top few urn of the sample.

Sample Preparation:

Sample preparation can be minimal or elaborate for SEM analysis depending on the nature of the samples and the data required. Minimal preparation includes acquisition of a ***SANGU PARPAM*** that will fit into the SEM chamber. And it should be analyzed.

INDUCTIVELY COUPLED PLASMA OPTICAL EMISSION SPECTROMETRY (ICP-OES),

Fig. 5: ICPOES Apparatus

ICP OES METHODOLOGY:

ICP, abbreviation for Inductively Coupled Plasma, is one method of optical emission spectrometry, When plasma energy is given to an analysis sample from outside, the component elements (atoms) is excited. When the excited atoms return to low energy position, emission rays that correspond to the photon wavelength are measured. The element type is determined based on the position of the photon rays, and the content of each element is determined based on the ray's intensity.

To generate plasma, first, argon gas is supplied to torch coil, and high frequency electric current is applied to the work coil at the tip of the torch tube. Using the electromagnetic field created in the torch tube by the high frequency current, argon gas in ionized and plasma is generated. This plasma has high electron density and temperature (10000K) and this energy is used in the excitation –emission of the sample. Solution samples are introduced into the plasma in an atomized state through the narrow tube in the center of the torch tube.

Sample preparation:

Solids cannot be analyzed directly. Such samples should be made into clear aqueous medium quantitatively. When acids are used to prepare solutions care should be taken. The concentration of the acids in the final provided solution should not be more than 2% v/v. highly acidic and organic solutions cannot be analyzed. As a guide line weigh exactly, around 200mg of substance and dissolve in 5mL of 5% of water or aquaregia or whatever acid to make 100mL of final solution. Make proper dilutions, if necessary. Free HF should not present in the final solution to be aspirated.

Ideal concentration is around 100 ppm of the element of interest. Total dissolved solids should be not more than 0.2% w/v in the final solution Very dilute solution may not give reliable results. Each element has a detection limit. A minimum solution volume of 25 ml is necessary for analysis.

In ICP intensity of light emitted when the sample "sprayed or aspirated into an argon plasma" is measured at different wavelengths. The intensity of light at a given wavelength will be proportional to a particular elemental ion concentration. The intensity is calibrated with known standard concentration. For accurate quantitative results It is necessary to simulate the sample matrix condition with that of the standard. Each element generally will have many emission lines and the sensitivity is different for each of this wave length. When more than one element is present it is quite common that some emission lines interfere due to overlapping.

It is preferable to use plastic containers for sample handling and preserving samples for **ICP-OES** analysis. Glass containers can give problems especially when analyzing certain metal ions at low concentration.

The samples of ***SANGU PARPAM*** was prepared.

ACUTE TOXICITY STUDY IN FEMALE WISTAR ALBINO RATS TO EVALUATE TOXICITY PROFILE OF *SANGU PARPAM*

OBJECTIVES

The aim of this study is to evaluate the toxicity of the test substance ***SANGU PARPAM*** , when administered orally to Female Wistar Albino Rats with different doses, so as to provide a rational base for the evaluation of the toxicological risk to man and indicate potential target organs.

Guidelines followed:

OECD Guidelines No.423

The experimental protocol was approved by Institutional Animal Ethical Committee as per the guidance of Committee for the Purpose of Control and Supervision of Experiments on Animals (CPCSEA), Ministry of Environment and Forest, Government of India.

Study design and Controls:

1) Female Wistar Albino Rats in controlled age and body weight were selected.
2) ***SANGU PARPAM*** was administered at 5mg/kg, 50mg/kg, 300mg/kg, 2000 mg/kg body weight as (Water) as suspension along with blank.
3) The results were recorded on the day of drug administration approximately 1^{st}, 3^{rd} , 4^{th} and 24^{th} hour in post dosing and further made into observation upto 14 days.

EXPERIMENTAL PROCEDURE

1.Animals

1.1.Supply

A total of 15 Female Wistar Albino Rats with an approximate age of 6 weeks are purchased from JAWAHARLAL INSTITUTE OF POSTGRADUATE MEDICAL EDUCATION AND RESEARCH, PUDUCHERRY-6. On their arrival, a sample of animals was chosen at random and weighted to ensure compliance with the age requested. The mean weights of Female Wistar Albino Rats were 100 – 150g respectively. The animals were housed in metabolic cages (55 X 32.7 X 19 cm), with sawdust litter, in such a way that each cage contained a maximum of 3 rats of the same sex.

All animals underwent a period of 14 days of observation and acclimatization between the date of arrival and the start of treatment. During the course of this period, the animals were inspected by a veterinary surgeon to ensure that they fulfilled the health requirements necessary for initiation of the study.

1.2. Housing

The Female Wistar Albino Rats were housed in metabolic cages (55 X 32.7 X 19 cm), placed on racks. From the week before initiation of the treatment, each cage contained a maximum of 3 rats of the same sex and treatment group.

Each cage was identified by a card, color coded according to the dose level. This card stated the cage number, number and sex of the animals it contained, Study number, test substance code, administration route, dose level and study drugs name, date of the arrival of the animals and initiation of treatment.

The temperature and relative humidity were continuously monitored. Lighting was controlled to supply 12 hours of light (7:00 to 19:00 hours) and 12 hours of dark for each 24 hour period.

The animals were kept in a clean environment with 12 hour light and 12 hour dark cycles. The air was conditioned at 22±3°C and the relative humidity was maintained between 30 – 70% with 100% exhaust facility.

The cages corresponding to each experimental group were distributed on racks in such a manner that external factors, such as environmental conditions, were balanced as far as possible.

2.Diet

All the rats had free access to a pelleted rat diet. The diet was analyzed by the manufacturer to check its composition and to detect possible contaminants.

2.1. Water

The water was offered ad libitum in bottles.

3.Administration Route and Procedure

The test substance was administered orally. The Female Wistar Albino Rats belonging to the control group were treated with the vehicle(Water) at the same administration volume as the rest of the treatment groups.

The animals were marked on body with picric acid solution prepared in water. The marking within the cage was as below.

Table-1 Grouping and Marking of Animals

Group No	Animal Marking
1	Head
2	Body
3	Tail

The group number, cage number, sex of the animal and animal number were identified as indicated below using cage label and body marking on the animals.

Table – 2 Numbering and Identification

Cage No	Group No	Animal marking	Sex
1	I	H,B,T	Female
2	II	H,B,T	Female
3	III	H,B,T	Female
4	IV	H,B,T	Female
5	V	H,B,T	Female

3.1. Doses:

The doses for the study were selected based on literature search and range finding study. Following the period of fasting, the animals were weighted and then drug was administered orally as single dose using a needle fitted onto a disposable syringe of approximate size at the following different doses.

Table – 3. Doses

GROUP	DOSE
Group –I	Control
Group – II	5mg/kg
Group – III	50mg/kg
Group – IV	300mg/kg
Group – V	2000mg/kg

The test substance was administered as single dose. After single dose administration period, all animals were observed for 14 days.

3.2. Dose Preparation

SANGU PARPAM was added in distilled water and completely dissolved to oral form for administration. The dose was prepared for a required concentration

before dosing by dissolving in distilled water. It was mixed well. The preparation for different doses was vary in concentrations to allow a constant dosage volume.

3.3. Administration

The test substance was administered orally to each female Wistar Albino rats as single dose using a needle [straight, 10guage, 5.9 inches (15.2cm) length, 6.4mm tip] fitted onto a disposable syringe of appropriate size at the following different doses. The concentration was adjusted according to its body weight. The volume was not exceeding 10ml/kg bodyweight. Variability in test volume was minimized by adjusting the concentration to ensure a constant volume at all dose levels.

3.4. Observation period

All animals were observed for any abnormal clinical signs and behavioral changes. The appearance, change and disappearance of these clinical signs, if any, were recorded for approximately 1.0, 3.0, 4.0 and 24.0 hours post-dose on day of dosing and once daily thereafter for 14 days. Animals in pain or showing severe signs of distress were humanely killed. The cageside observation includes changes in skin, fur, eyes and mucous membranes, occurrence of secretions and excretions. Autonomic activity like lacrimation, piloerection, pupil size and unusual respiratory pattern, changes in gait, posture, response to handling, presence of clonic or tonic movements, stereotypes like excessive grooming and repetitive circling or bizarre behavior like self – mutilation, walking backwards etc were observed. At the 14^{th} day, sensory reactivity to stimuli of different types (e.g: auditory, visual and proprioceptive stimuli) was conducted. Auditory stimuli responses were measured by clicker sound from approximately 30cm to the rats; Visual stimuli response were measured with the help of shining pen light in the eye of rats and placing a blunt object near to the eye of rats. Response to proprioceptive stimuli was measured by placing anterior/dorsal surface of animals paw to the table edge. The responses of reactions for these three exercises were normal in animals belonging to both the controls as well as drug treatment dose groups.

4.0 Mortality and Morbidity

All animals were observed daily once for mortality and morbidity at approximately 1.0, 3.0, 4.0 and 24.0 hours post dose on day of dosing and twice daily (morning and afternoon) thereafter for 14 days.

SUB-ACUTE TOXICITY STUDY IN WISTAR ALBINO RATS TO EVALUATE TOXICITY PROFILE OF *SANGU PARPAM*

1.Objective

The objective of this 'Sub-acute toxicity study of ***SANGU PARPAM*** on Wistar Albino Rats' was to assess the toxicological profile of the test item when treated as a single dose. Animals should be observed for 28 days of drug administration. This study provides information on the possible health hazards likely to arise from exposure over a relatively limited period of time.

2. Test Guideline followed

OECD 407 Method – Sub-Acute Toxic Class Method (Repeated Dose 28-Day Oral Toxicity Study in Rodents)

3. Test Substance Detail

Name : ***SANGU PARPAM***

4. Test System Detail

The study was conducted on 3 male and 3 female Wistar Albino Rats. These animals were selected because of the recommended rodent species for oral studies as per followed guideline and availability of animals 6 weeks old male and female rats were selected after physical and behavioral examination. The body weight range was fallen within ± 20% of the mean body weight at the time of randomization and grouping. The rats were housed in standard laboratory condition in Polypropylene cages, provided with food and water *ad libitum*. The experimental protocol was approved by Institutional Animal Ethical Committee as per the guidance of Committee for the Purpose of Control and Supervision of Experiments on Animals (CPCSEA), Ministry of Environment and Forest, Government of India.

5.Acclimatization

The animals were selected after veterinary examination by the Veterinarian. All the selected animals were kept under acclimatization for a week.

6.Randomization & grouping

One day before the initiation of treatment (days 0- last day of acclimatization), the selected animals were randomly grouped into four different groups containing minimum 6 animals (3 Male + 3 Female) per group.

7. Numbering and Identification

The animals were marked on body with picric acid solution prepared in water. The marking within the cage was as below.

Table-4 Animal Identification

Group No	Animal marking
Control	H,B,T, E, L, NM
Low dose	H,B,T, E, L, NM
Mid dose	H,B,T, E, L, NM
High dose	H,B,T, E, L, NM

The group no., cage no., sex of the animal and animal no. were identified as indicated below using cage label and body marking on the animals.

Table-5 Animal Marking

Cage no	Group no	Animal marking	Sex
1	Control	H, B,T	Male
		E, L, NM	Female
2	Low dose	H, B,T	Male
		E, L, NM	Female
3	Mid dose	H, B,T	Male
		E, L, NM	Female
4	High dose	H, B,T	Male
		E, L, NM	Female

H – Head, B – Body, T – Tail, E- Earlobe, L – Limb, NM – No Marking

8. Husbandry

8.1. Housing

The Wistar Albino Rats were housed in standard polypropylene cages with stainless steel top grill. Paddy husk was used as bedding. The paddy husk was changed at least twice in a week. From the week before initiation of the treatment, each cage contained a maximum of 3 rats of the same sex and treatment group.

8.2. Environmental conditions

The animals were kept in a clean environment with 12 hour light and 12 hour dark cycles. The air was conditioned at 22±3°C and the relative humidity was maintained between 30 – 70% with 100% exhaust facility. The cages corresponding to each experimental group were distributed on racks in such a manner that external factors such as environmental conditions were balanced as far as possible.

8.3 Feed & feeding schedule

Feed was provided ad libitum throughout the study period, except over night fasting (18-20 hours) prior to dose administration. After the substance has been administered, food was with held for a further 3-4 hours.

8.4 Water

The water was offered ad libitum in bottles. They were periodically analyzed to detect the presence of possible contaminants.

8.5 Doses

The doses for the study were selected based on literature search and range finding study. Following the period of fasting, the animals were weighed and then test substance was administered orally as single dose using a needle fitted onto a disposable syringe of approximate size at the following different doses.

Table – 6 Dose level

TEST GROUP	DOSE TO ANIMALS (mg/kg body – weight/day)	NUMBER OF ANIMALS
Group – I	Control	6(3male and 3female)
Group – II	Low dose of ***SANGU PARPAM*** (200mg/ Kg)	6(3male and 3female)
Group – III	Mid dose of ***SANGU PARPAM*** (400mg/ Kg)	6(3male and 3female)
Group – IV	High dose of ***SANGU PARPAM*** (600mg/ Kg)	6(3male and 3female)

The test substance was administered as single dose for 28 days and all animals are observed .

8.5 a. Dose preparation

SANGU PARPAM was added in distilled water and completely dissolved to for oral for administration. The dose was prepared of a required concentration before dosing by dissolving ***SANGU PARPAM*** in distilled water. It was mixed well. The preparation for different doses was vary in concentrations to allow a constant dosage volume.

8.6. Administration

The test substance was administered orally to each rat as single dose using a needle fitted onto a disposable syringe of appropriate size at the following different doses. The concentration was adjusted according to its body weight. The volume was not exceeding 10ml/kg body weight. Variability in test volume was minimized by adjusting the concentration to ensure a constant volume at all dose levels.

9. Observation

These observations were also performed on week – ends. The observations included but were not limited to changes in skin, fur, eyes, mucous membranes, and in the respiratory, circulatory, central nervous, autonomous systems, somatomotor activity and behavior.

9.1. Clinical signs of toxicity

All the rats were observed atleast twice daily with the purpose of recording any symptoms of ill-health, behavioral changes and clinical signs of toxicity daily for 28 days.

9.2. Food intake

Prior to the beginning of treatment and daily food intake of each cage was recorded for period of 28 days and the mean weekly intake per rats was calculated.

9.3 Water intake

Water intake was checked by visual observation during the study. In addition, the water consumption in each cage was measured daily for a period of 28days.

9.4 Body weight

The body weight of each rat was recorded one week before the start of treatment, and during the course of the treatment on the day of initial, 7^{th}, 14^{th} , 21^{st}

and 28th day. The mean weight for the different groups and sexes were calculated from the individual weight.

Blood collection

Blood was collected through retro – orbital sinus from all the animals of different groups on 29th day. The blood was collected in tubes containing Heparin/EDTA as an anticoagulant. Animals were fasted over night prior to the blood collection.

LABORATORY STUDIES

After the 4th week of treatment, samples of blood were withdrawn from the orbital sinus from each group, under weak ether anesthesia after fasting for 16 hours. The blood samples are used to evaluate Hematological parameters like RBC, WBC, Hb% and DC. The collected blood samples also centrifuged 10000rpm in 10 minutes to separate the serum. The separated serum used to evaluate biochemical parameters like SGOT, SGPT, ALP, UREA and CREATININE etc.

Hematology

The following hematological parameters were analysed using Autoanalyser

Hb : Haemoglobin(gm%)

WBC : White Blood Corpuscles ($x10^3$/cu.mm)

RBC : Red Blood Corpuscles ($x10^6$/cu.mm)

Differential count:

N : Neutrophils (%)

L : Lymphocytes (%)

M : Monocytes (%)

E : Eosinophils (%)

B : Basophils (%)

Clinical biochemistry:

The following clinical Bio-chemical parameters were analysed using Auto analyser

ALT/SGPT : Alanine amino transferase (U/L)

AST/SGOT : Aspartate amino transferase (U/L)

ALP : Alkaline serum phosphatase (U/L)

SERUM UREA (mg/dl)

SERUM CREATININE (mg/dl)

Terminal studies

Sacrifice and macroscopic examination

On completion of the 28 days of treatment, Wistar Albino Rats were sacrificed by ether inhalation. A full autopsy was performed on all animals which included examination of the external surface of the body, all orifices, cranial, thoracic and abdominal cavities and their contents both in situ and after evisceration. As the number of animals exceeded the number that could be sacrificed in one day, the autopsies were carried out over three consecutive days at the end of the treatment period.

Organ weights:

After the macroscopic examination the following organs were weighed after separating the superficial fat: Heart, Kidneys and Liver.

HISTOPATHOLOGICAL STUDIES

Anatomy of the liver was studied immediately after sacrificing the animals. A small portion was fixed in 10% neutral buffered formalin as described by Luna 14. Thin sections of 4-5µm were taken, stained with Haematoxylin and Eosin and histology was studied.

RESULTS

QUALITATIVE AND QUANTITATIVE ANALYSIS

Table -7

Colour characters of *SANGU PARPAM*

No	Nature of drug	Nature of colour
1	***SANGU PARPAM***	Light Yellow

Table 8— Physicochemical analysis of samples of *SANGU PARPAM*

[Values are mean of three determinations ±SEM]

Parameters	Total ash	Values
Ash value	Water soluble ash Acid insoluble ash	7.75±0.011 0.95±0.011
Extractive value	Water soluble extractive value	8.20±0.310
Loss on drying	Loss on drying at 70°C	7.30±0.240

SEM- singularity expansion method

Table-9

Particle size and pH of *SANGU PARPAM*

S.No	Parameters	Values obtained
1	Particle size by SEM	0.5-2 μ
2	pH	9.540

SANGU PARPAM (FTIR METHOD)

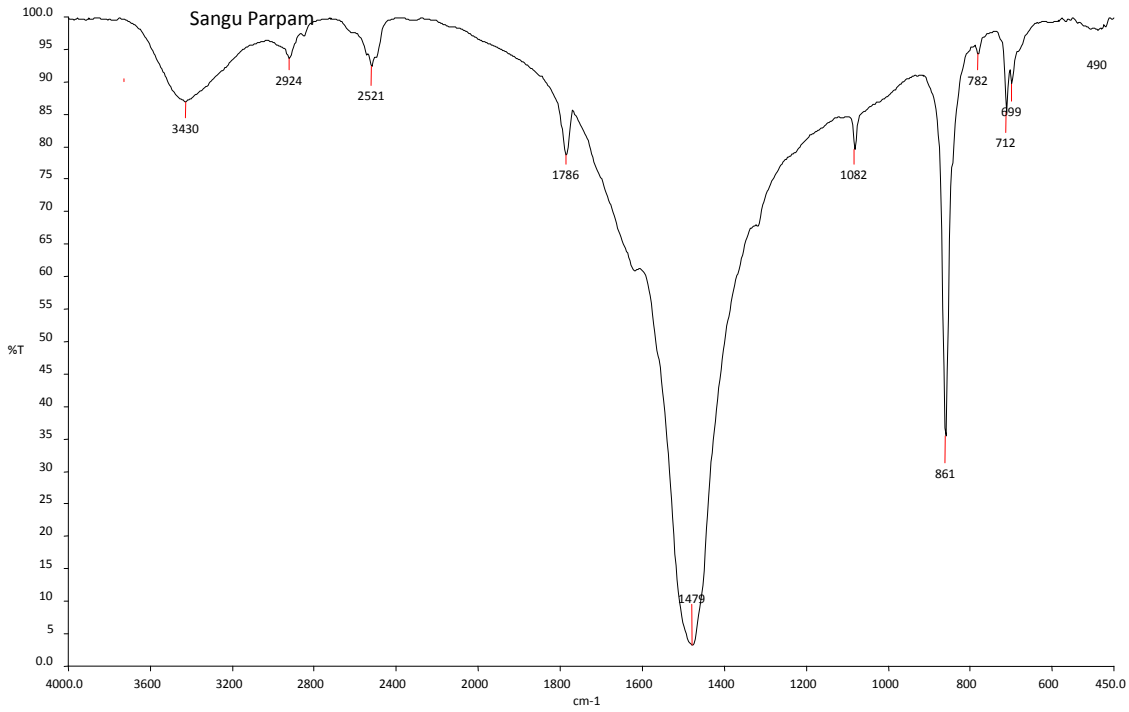


Table - 10

SANGU PARPAM

Table of characteristic IR Absorptions

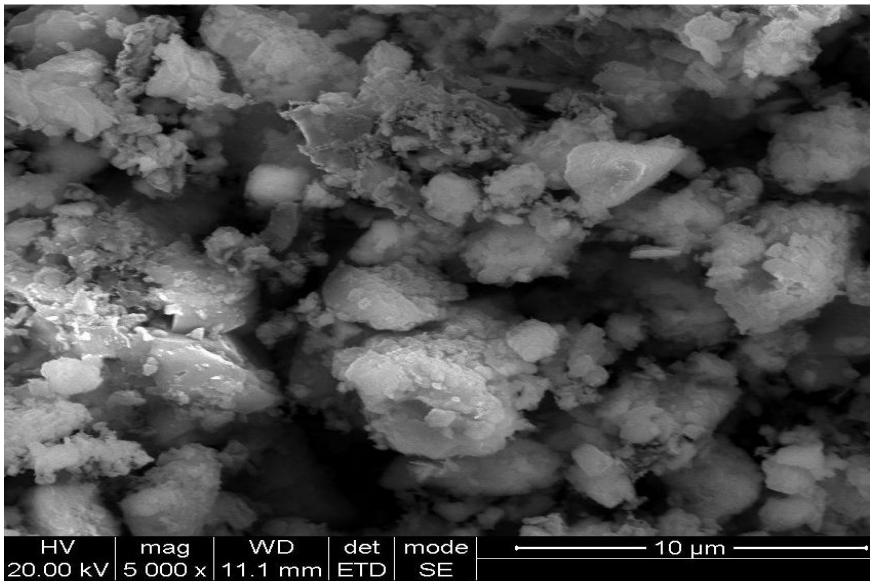
Absorption cm^{-1}	Intensity	Class of compounds	Assignment
699	S	Aromatic compound	C-H bond
	S, broad	Alkynes	=C-H bend
	M-S, broad	Alkene	=C-H bend
712	M-S, broad	Alkene	=C-H bend
782	S	Alkyl halide	C-Cl stretch
	S	Aromatic compound	C-H bend
861			
1082	VS	Alkyl halide	C-F stretch
	M-S	Alcohol	C-O stretch
1479	M-S	Aromatic compounds	ring C=C stretch
1786	S	Acyl chloride	C=O stretch
	S	Esters	C=O stretch
2521	S, broad	Carboxylic acid	O-H stretch
2924	S, broad	Carboxylic acid	O-H stretch
3430	W-M	Amides	N-H sym S asym.stretch
	S, broad	Carboxylic acid	O-H stretch
	W	Amine	N-H stretch

Inference :

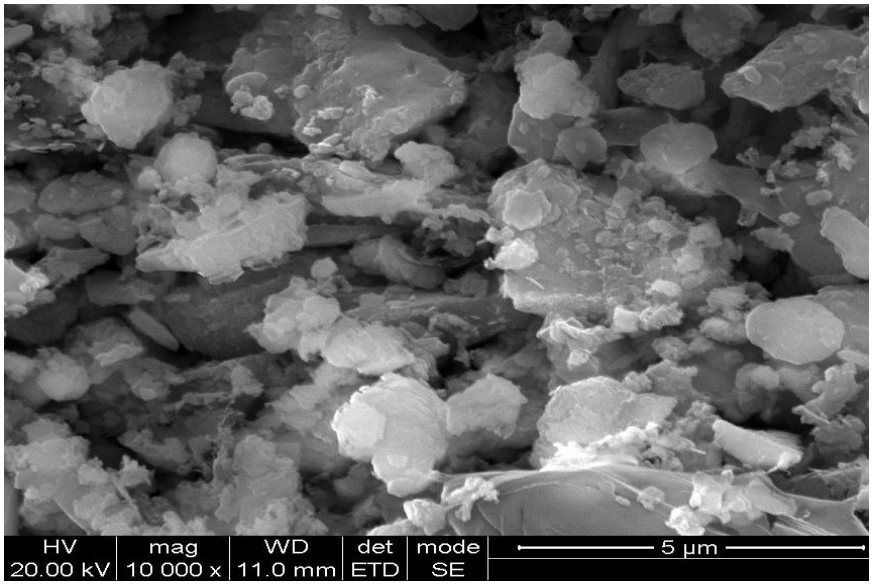
The ***SANGU PARPAM*** contains, Aromatic compounds, Alkynes, Alkene, Alkyl halide, Alcohal, Acyl chloride, Esters, Carboxylic acids, Amides, Amines.

SEM ANALYSIS

Scanning Electron Microscope (SEM)



SEM -5000 Magnification



SEM -10000 Magnification

Results and Interpretation of SEM analysis:

The morphology of the ***SANGU PARPAM*** sample can be determined by SEM (FEI Quanta). A representative portion of each sample must be sprinkled onto a double side carbon tape and mounted on aluminium stubs, in order to get a higher quality secondary electron image for SEM examination. We have observed from SEM photographs that particles are spherical in shapes and sizes are in the range from

0.5-2 micron. Although the particle sizes of different batches showed similarity, it seems that these particles are aggregates of much smaller particles. When dispersed in an aqueous medium, these preparations form a negatively charged hydrophobic particle suspension. This hydrophobicity gives these particles a tendency to aggregate together to form larger particles. Sangu parpam exhibited larger sizes and agglomeration of the particles. Therefore, the comparatively larger size may be due to the agglomeration of the particles by repeated cycles of calcinations involved in preparation.

SOPHISTICATED ANALYTICAL INSTRUMENT FACILITY

IITM, CHENNAI-36

PERKIN ELMER OPTIMA 5300 DV ICP-OES

Sample ID	**Elements Symbol Wavelength (nm)**	**Concentration**
(wt:0.31120g)		
Al 396.152	BDL	
As 188.979	BDL	
Ca 315.807	422.180 mg/L	
Cd 228.802	BDL	
Cu 327.393	BDL	
Fe 238.204	00.376 mg/L	
Hg 253.652	BDL	
K 766.491	00.821 mg/L	
Mg 285.213	01.124 mg/L	
Na 589.592	01.320 mg/L	
Ni 231.604	BDL	
Pb 220.353	BDL	
P 213.617	76.341 mg/L	
S 180.731	01.314 mg/L	
Zn 206.200	01.228 mg/L	

BDL- Below detection limit

SANGU PARPAM contains Aluminium, Arsenic, Cadmium, Copper, Mercury, Nickel, Lead are in below detection limit.

RESULTS:

PH range : **9.54**

FTIR data : ***SANGU PARPAM*** contains Aromatic compounds, Alkynes, Alkene, Alkyl halide, Alcohal, Acyl chloride, Esters, Carboxylic acids, amides and amines.

HR SEM : ***SANGU PARPAM*** has the particle size in the range of **0.5 - 2 micron**

ICP-OES data : ***SANGU PARPAM*** shows Aluminium, Arsenic, Cadmium, Copper, Mercury, Nickel and Lead are in below detection limit.

BIO-CHEMICAL ANALYSIS OF *SANGU PARPAM*

Preparation of the extract:

100mgs of parpam is weighted accurately and placed into a clean beaker and added a few drops of Conc. Hydrochloric acid and evaporated it well. After evaporation cooled the content and added a few drops of conc. nitric acid and evaporated it well. After cooling the content add 20ml of distilled water and dissolved it well. Then it is transferred to 100ml volumetric flask and made up to 100ml with distilled water, mix well, filter it. Then it is taken for analysis.

Table - 11

BIO-CHEMICAL ANALYSIS

S.NO	EXPERIMENT	OBSERVATION	INFERENCE
1.	**TEST FOR CALCIUM** 2ml of the above prepared extract is taken in a clean test tube. To this add 2ml of 4% Ammonium oxalate solution	A white precipitate is formed	**Indicates the presence of calcium**
2.	**TEST FOR SULPHATE** 2ml of the extract is added to 5% Barium chloride solution.	A white precipitate is formed	**Indicates the presence of sulphate**
3.	**TEST FOR CHLORIDE** The extract is treated with silver nitrate solution	A white precipitate is formed	**Indicates the presence of chloride**
4.	**TEST FOR CARBONATE** The substance is treated with concentrated Hcl.	A Brisk effervessence is formed	**Indicates the presence of carbonate**
5.	**TEST FOR STARCH** The extract is added with weak iodine solution	No Blue colour is formed	Absence of starch
6.	**TEST FOR FERRIC IRON** The extract is acidified with Glacial acetic acid and potassium ferro cyanide.	No blue colour is formed	Absence of ferric iron

7.	**TEST OF FERROUS IRON** The extract is treated with concentrated Nitric acid and Ammonium thio cyanate solution	Blood red colour is formed	**Indicates the presence of ferrous iron**
8.	**TEST FOR PHOSPHATE** The extract is treated with Ammonium Molybdate and concentrated nitric acid	No yellow precipitate is formed	Absence of phosphate
9.	**TEST FOR ALBUMIN** The extract is treated with Esbach's reagent	No Yellow precipitate is formed	Absence of Albumin
10.	**TEST FOR TANNIC ACID** The extract is treated with ferric chloride.	No Blue black precipitate is formed	Absence tannic acid
11.	**TEST FOR UNSATURATION** Potassium permanganate solution is added to the extract	It doesnot gets decolourised.	Absence of unsaturated compound
12.	**TEST FOR THE REDUCING SUGAR** 5ml of Benedict's qualitative solution is taken in a test tube and allowed to boil for 2 mts and add 8-10 drops of the extract and again boil it for 2 mts.	No colour change occurs.	Absence of Reducing sugar
13.	**TEST FOR AMINO ACID** One or two drops of the extract is placed on a filter paper and dried well. After drying, 1% Ninnhydrin is sprayed over the same and dried it well.	No Violet colour is formed	Absence of Amino acid
14.	**TEST FOR ZINC** The extract is treated with Potassium Ferrocyanide.	No white precipitate is formed	Absence of Zinc.

Inference:

Analysis reveals the presence of **Calcium, Sulphate, Chloride, Carbonate, Ferrous iron** in ***SANGU PARPAM* .**

Biochemical Analyis report was given by **Mrs. N.Nagaprema, M.Sc., H.O.D, Bio Chemical Department, Government Siddha Medical College, Palayamkottai.**

Effect of Acute Toxicity (14 Days) of *SANGU PARPAM*

Table - 12 Physical and behavioral examinations.

Group no.	Dose(mg/kg)	Observation sign	No. of animal affected.
Group-I	Control Distilled water (1ml/kg)	Normal	0 of 3
Group- II	5mg/kg	Normal	0 of 3
Group-III	50mg/kg	Normal	0 of 3
Group-IV	300mg/kg	Normal	0 of 3
Group-V	2000mg/kg	Normal	0 of 3

Table- 13 Showed the effect of Control – Distilled water (1ml/kg) on general behavior after single oral administration in Rat.

SI.NO	General Behavior	Time of observation after Control - Distilled water (1ml/kg) administration			
		1st Hr	3rd Hr	4th Hr	24th Hr
1	Sedation	-	-	-	-
2	Hypnosis	-	-	-	-
3	Convulsion	-	-	-	-
4	Ptosis	-	-	-	-
5	Analgesia	-	-	-	-
6	Stupor reaction	-	-	-	-
7	Motor activity	-	-	-	-
8	Muscle relaxant	-	-	-	-
9	CNS stimulant	-	-	-	-
10	CNS depressant	-	-	-	-
11	Pilo erection	-	-	-	-
12	Skin colour changes	-	-	-	-
13	Lacrimation	-	-	-	-
14	Stool consistency	-	-	-	-

'+' PRESENT & '-' ABSENT

Table - 14 Showed the effect of *SANGU PARPAM* (5mg/kg) on general behavior after single oral administration in Rat.

SI.NO	General Behavior	Time of observation after *SANGU PARPAM* (5mg/kg) administration			
		1st Hr	3rd Hr	4th Hr	24th Hr
1	Sedation	-	-	-	-
2	Hypnosis	-	-	-	-
3	Convulsion	-	-	-	-
4	Ptosis	-	-	-	-
5	Analgesia	-	-	-	-
6	Stupor reaction	-	-	-	-
7	Motor activity	-	-	-	-
8	Muscle relaxant	-	-	-	-
9	CNS stimulant	-	-	-	-
10	CNS depressant	-	-	-	-
11	Pilo erection	-	-	-	-
12	Skin colour changes	-	-	-	-
13	Lacrimation	-	-	-	-
14	Stool consistency	-	-	-	-

'+' PRESENT & '-' ABSENT

Table - 15 Showed the effect of *SANGU PARPAM* (50mg/kg) on general behavior after single oral administration in Rat.

SI.NO	General Behavior	Time of observation after *SANGU PARPAM* (50mg/kg) administration			
		1st Hr	3rd Hr	4th Hr	24th Hr
1	Sedation	-	-	-	-
2	Hypnosis	-	-	-	-
3	Convulsion	-	-	-	-
4	Ptosis	-	-	-	-
5	Analgesia	-	-	-	-
6	Stupor reaction	-	-	-	-
7	Motor activity	-	-	-	-
8	Muscle relaxant	-	-	-	-
9	CNS stimulant	-	-	-	-
10	CNS depressant	-	-	-	-
11	Pilo erection	-	-	-	-
12	Skin colour changes	-	-	-	-
13	Lacrimation	-	-	-	-
14	Stool consistency	-	-	-	-

'+' PRESENT & '-' ABSENT

Table - 16 Showed the effect of *SANGU PARPAM* (300mg/kg) on general behavior after single oral administration in Rat.

SI.NO	General Behavior	Time of observation after *SANGU PARPAM* (300mg/kg) administration			
		1st Hr	3rd Hr	4th Hr	24th Hr
1	Sedation	-	-	-	-
2	Hypnosis	-	-	-	-
3	Convulsion	-	-	-	-
4	Ptosis	-	-	-	-
5	Analgesia	-	-	-	-
6	Stupor reaction	-	-	-	-
7	Motor activity	-	-	-	-
8	Muscle relaxant	-	-	-	-
9	CNS stimulant	-	-	-	-
10	CNS depressant	-	-	-	-
11	Pilo erection	-	-	-	-
12	Skin colour changes	-	-	-	-
13	Lacrimation	-	-	-	-
14	Stool consistency	-	-	-	-

'+' PRESENT & '-' ABSENT

Table - 17 Showed the effect of *SANGU PARPAM* (2000mg/kg) on general behavior after single oral administration in Rat.

SI.NO	General Behavior	Time of observation after *SANGU PARPAM* (2000mg/kg) administration			
		1st Hr	3rd Hr	4th Hr	24th Hr
1	Sedation	-	-	-	-
2	Hypnosis	-	-	-	-
3	Convulsion	-	-	-	-
4	Ptosis	-	-	-	-
5	Analgesia	-	-	-	-
6	Stupor reaction	-	-	-	-
7	Motor activity	-	-	-	-
8	Muscle relaxant	-	-	-	-
9	CNS stimulant	-	-	-	-
10	CNS depressant	-	-	-	-
11	Pilo erection	-	-	-	-
12	Skin colour changes	-	-	-	-
13	Lacrimation	-	-	-	-
14	Stool consistency	-	-	-	-

'+' PRESENT & '-' ABSENT

Table - 18 Home cage activity

Functional and Behavioral observation	Observation	Control Distilled water (1ml/kg)	5mg/kg Group (G-II)	50mg/kg (G-III)	300mg/kg (G-IV)	2000mg/kg (G-V)
		Female n=3	Female n=3	Female n=3	Female n=3	Female n=3
Body position	Normal	3	3	3	3	3
Respiration	Normal	3	3	3	3	3
Clonic involuntary Movement	Normal	3	3	3	3	3
Tonic involuntary Movement	Normal	3	3	3	3	3
Palpebral closure	Normal	3	3	3	3	3
Approach response	Normal	3	3	3	3	3
Touch response	Normal	3	3	3	3	3
Pinna reflex	Normal	3	3	3	3	3
Tailpinch response	Normal	3	3	3	3	3

Table - 19 Hand held observation

Functional and Behavioral observation	Observation	Control Distilled water (1ml/kg)	5 mg/ kg (G-II)	50 mg/kg (G-II)	300 mg/kg (G-III)	2000 mg/kg (G-V)
		Female n=3	Female n=3	Female n=3	Female n=3	Female n=3
Reactivity	Normal	3	3	3	3	3
Handling	Normal	3	3	3	3	3
Palpebral closure	Normal	3	3	3	3	3
Lacrimation	Normal	3	3	3	3	3
Salivation	Normal	3	3	3	3	3
Piloerection	Normal	3	3	3	3	3
Pupillary reflex	Normal	3	3	3	3	3
Abdominal tone	Normal	3	3	3	3	3
Limb tone	Normal	3	3	3	3	3

Table - 20 Mortality

Group no	Dose level (mg/kg)	Mortality
Group-I	Control [Distilled water (1ml/kg)]	0 of 3
Group-II	5(mg/kg)	0 of 3
Group-III	50(mg/kg)	0 of 3
Group-IV	300(mg/kg)	0 of 3
Group-V	2000(mg/kg)	0 of 3

Result:

From acute toxicity study it was observed that the administration of ***SANGU PARPAM*** up to the dose of 2000mg/kg to the rats do not produce drug-related toxicity and mortality. So No-Observed-Adverse-Effect-Level(NOAEL) of ***SANGU PARPAM*** is 2000mg/kg.

DISCUSSION

SANGU PARPAM was administered single time at the dose of 5mg/kg, 50mg/kg, 300mg/kg and 2000mg/kg to rats and observed for consecutive 14 days after administration. Doses were selected based on the pilot study and literature review. All animals were observed daily once for any abnormal clinical signs. Weekly body weight and food consumption were recorded. No mortality was observed during the entire period of the study. Data obtained in this study indicated no significance physical and behavioral signs of any toxicity due to administration of ***SANGU PARPAM*** at the doses of 5mg/kg, 50mg/kg, 300mg/kg and 2000mg/kg to rat.

At the 14^{th} day, all animals were observed for functional and general behavioral examination. In functional and general behavioral examination, home cage activity, hand held activity were observed. Home cage activities like Body position, Respiration, Clonic involuntary movement, Tonic involuntary movement, Palpebral closure, Approach response, Touch response, Pinna reflex, Sound responses, Tail pinch response were observed. Handheld activities like reactivity, Handling, Palpebral closure, Lacrimation, Salivation, Piloerection, Papillary reflex, abdominal tone, Limb tone were observed. Functional and general behavioral examination was normal in all

treated groups. Food consumption of all treated animals was found normal as compared to normal group.

Body weight at weekly interval was measured to find out effect of ***SANGU PARPAM*** on the growth rate. Body weight change in drug treated animals was found normal.

SUMMARY & CONCLUSION

Summary:

The present study was conducted to know single dose toxicity of ***SANGU PARPAM*** on female Wistar Albino Rats. The study was conducted using 15 female Wistar Albino Rats. The female animals were selected for study of 8-12 weeks old with weight range of within ±20% of mean body weight at the time of randomization. The groups were numbered as group I, II, III, IV and V and dose with 5mg/kg, 50mg/kg, 300mg/kg and 2000mg/kg of ***SANGU PARPAM***. The drug was administered by oral route single time and observed for 14 days. Daily the animals were observed for clinical signs and mortality. Body weight of animals was recorded once in a week.

There were no physical and general behavioral changes observed in Wistar Albino Rats of 5mg/kg, 50mg/kg, 300mg/kg and 2000mg/kg to rats during 14 days.

Body weight of all animals did not reveal any significant change as compared to vehicle control group.

Food consumption of all group animals was normal.

Mortality was not observed in all treatment groups.

Conclusion:

The study shows that ***SANGU PARPAM*** did not produce any toxic effect and mortality at dose of 5mg/kg, 50mg/kg, 300mg/kg and 2000mg/kg to rats. So NO-Observed-Adverse-Effect-Level(NOAEL) of ***SANGU PARPAM*** is 2000mg/kg.

SUB-ACUTE TOXICITY RESULTS

Table - 21. RESULTS OF SUB-ACUTE TOXICITY STUDY (28 DAYS) OF *SANGU PARPAM* ON BODY WEIGHT (IN GRAM) (PHYSICAL PARAMETER)

GROUP	CONTROL	LOW	MID	HIGH
1st day	122.3±1.05	125±1.543	124.3±2.1	123.3±1.03
7th day	132.3±1.03	131.3±1.342	130±2.012	134.3±1.03
14th day	134±1.004	134.3±1.12	134±1.13	134.1±1.004
21st day	138±1.20	139±1.50	140±2.23	138±2.12
28th day	140±1.04	141±2.23	143±2.04	141.3±1.04

Values are expressed as mean ± SEM Statistical significance (p) calculated by one way ANOVA followed by Dunnett's (n=6); NS- non significant, *p<0.05, **p<0.01, ***p<0.001, calculated by comparing treated groups with control group.

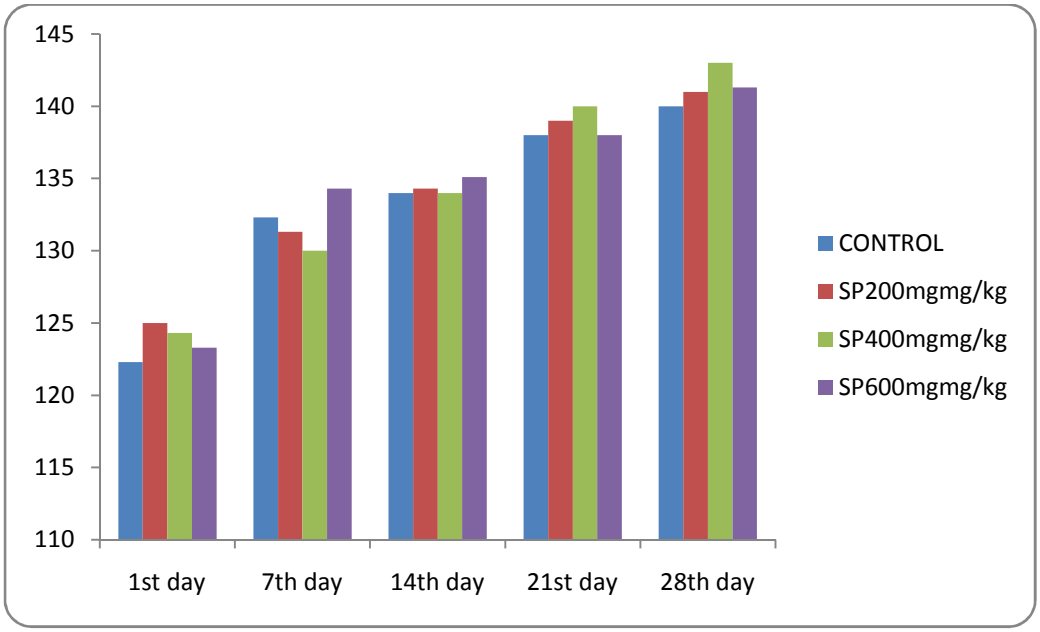


Table - 22 RESULTS OF SUB-ACUTE TOXICITY STUDY (28 DAYS) OF *SANGU PARPAM* ON FOOD INTAKE IN grams.

GROUP	CONTROL	LOW	MID	HIGH
1st day	40.16±3.3	39±2.09	40±3.8	40.5±2.54
7th day	41.8±2.54	40.7±1.91	41±2.42	40.8±2.5
14th day	42.6±1.52	41.52±2.3	42.53±2.57	42.55±1.8
21st day	43.57±2.35	42.65±1.6	43.55±2.22	44.58±3.5
28th day	45.62±2.19	44.32±1.12	45.68±3.10	46.21±1.6

Values are expressed as mean ± SEM Statistical significance (p) calculated by one way ANOVA followed by Dunnett's (n=6); NS- non significant, *p<0.05, **p<0.01, ***p<0.001, calculated by comparing treated groups with control group.

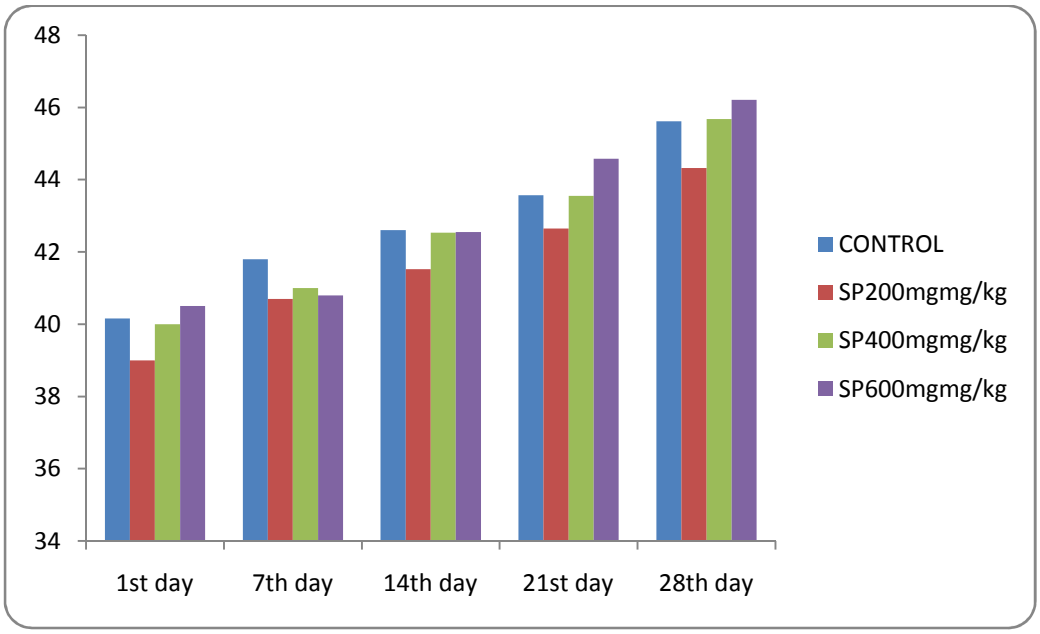


Table - 23 RESULTS OF SUB-ACUTE TOXICITY STUDY (28 DAYS) OF *SANGU PARPAM* ON WATER INTAKE IN (grams).

GROUP	CONTROL	LOW	MID	HIGH
1st day	93±15.6	94.5±12	95±15.6	94±14.4
7th day	92.3±11	92±15.12	93±15.6	91.8±12.6
14th day	94±14.4	94±14.4	94±16.3	93±10.54
21st day	92±14	92±17.1	93±15.6	96.8±6.6
28th day	93.1±15.6	94±14.4	96±11.2	98±11.4

Values are expressed as mean ± SEM Statistical significance (p) calculated by one way ANOVA followed by Dunnett's (n=6); NS- non significant, *p<0.05, **p<0.01, ***p<0.001, calculated by comparing treated groups with control group.

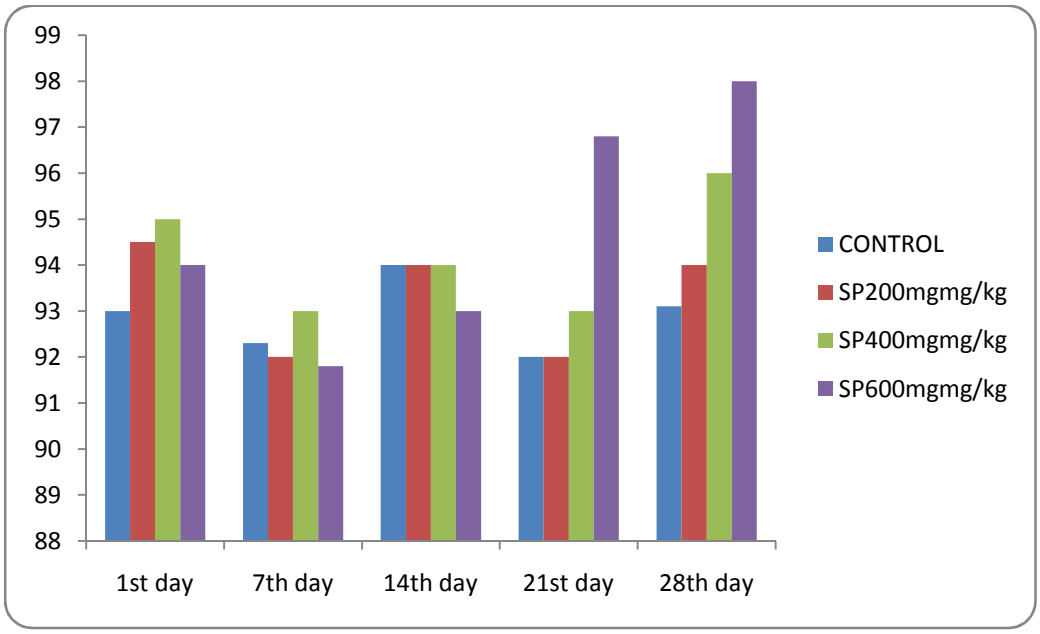


Table – 24 RESULTS OF SUB-ACUTE TOXICITY STUDY (28 DAYS) OF *SANGU PARPAM* ON ORGAN WEIGHT IN (grams).

GROUP		CONTROL	LOW	MID	HIGH
HEART		0.87±0.02	0.84±0.01	0.86±0.11	0.87±0.11
LIVER		6.32±0.23	6.43±0.23	6.30±0.02	6.47±0.02
KIDNEY	L	0.93±0.02	0.92±0.03	0.93±0.02	0.95±0.02
	R	0.91±0.02	0.93±0.02	0.91±0.01	0.92±0.03

Values are expressed as mean ± SEM Statistical significance (p) calculated by one way ANOVA followed by Dunnett's (n=6); NS- non significant, *p<0.05, **p<0.01, ***p<0.001, calculated by comparing treated groups with control group.

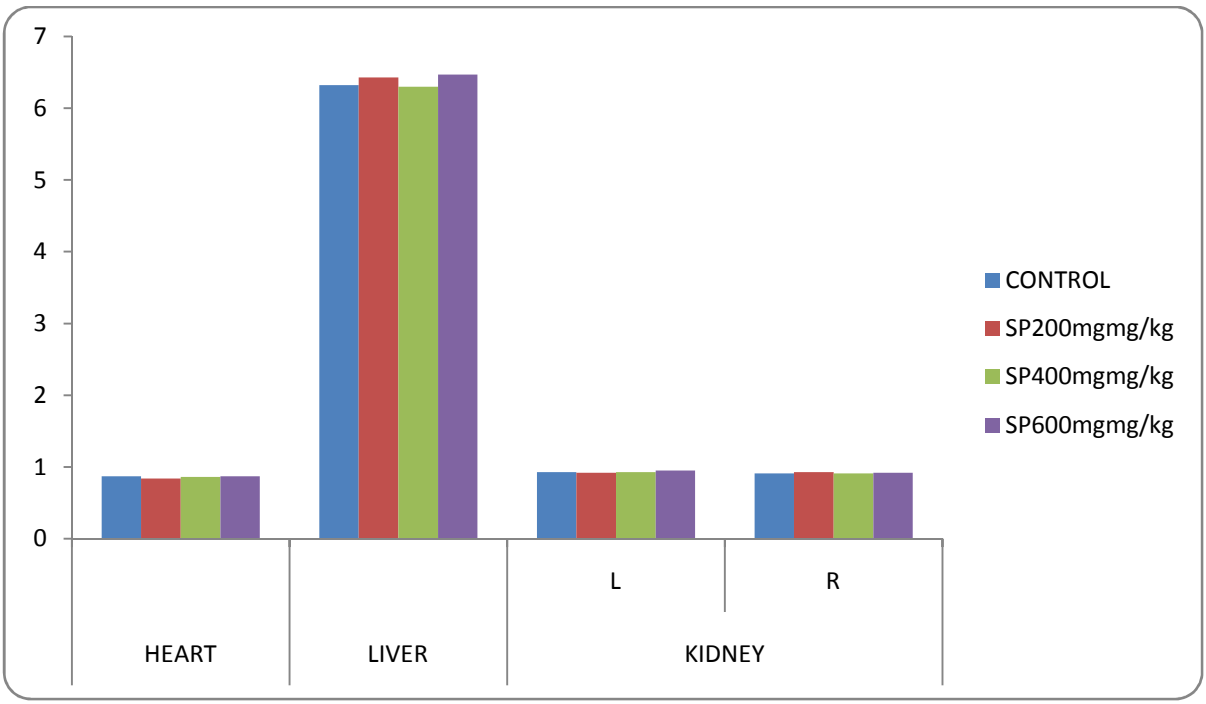
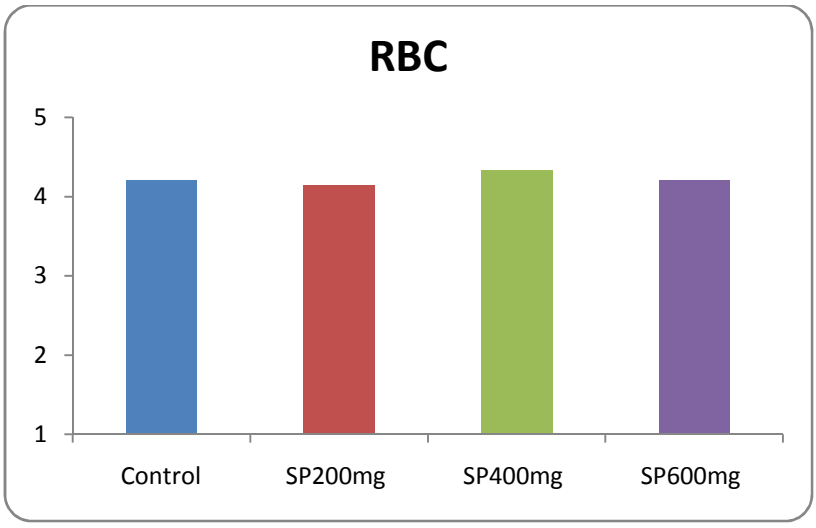
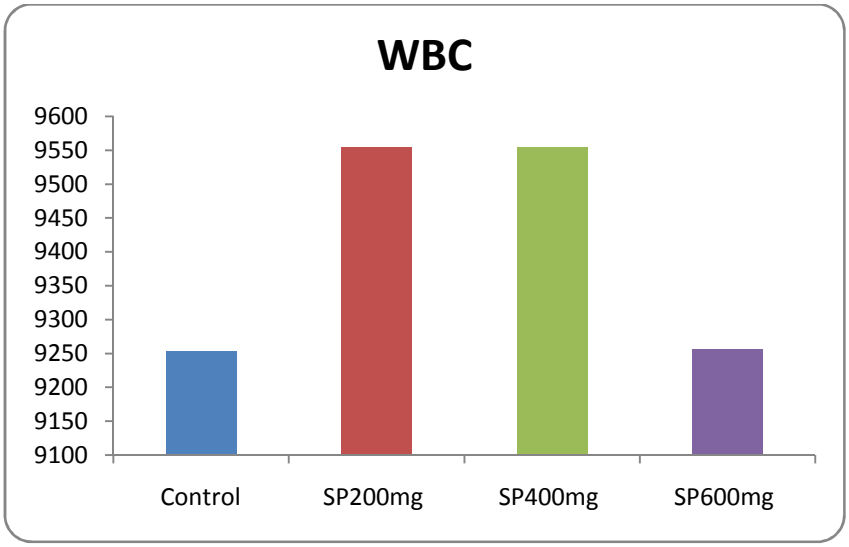


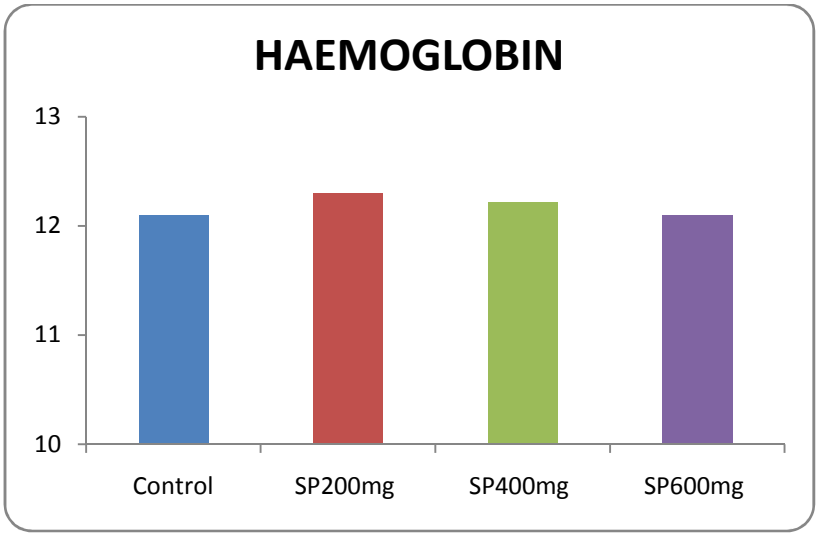
Table - 25 Shows the effect *SANGU PARPAM* on Hematological parameters in rats after 28 days treatment

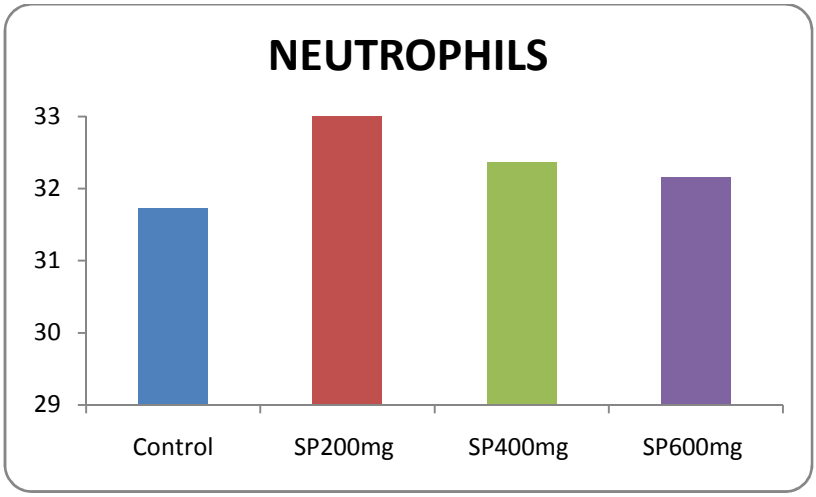
Drug treatment	RBC million cells/cu.mm	WBC cells/cu.mm	Haemoglobin gm %	Differential count %				
				Neutrophils	Eosinophils	Monocyte	Basophil	Lymphocyte
Control	4.21±0.1	9253.51± 41.32	12.10 ± 0.6	31.72± 1.60	1.93 ± 0.15	3.89 ± 0.19	0	63.17 ± 3.76
LOW	4.14±0.20	9554.05 ± 33.32	12.30 ± 0.83	34.61 ± 2.06	1.92 ± 0.09	3.09± 0.11	0	60.09 ±2.55
MID	4.33±0.21	9553.36 ± 74.46	12.22 ± 1.03	32.36± 1.11	1.87 ± 0.02	3.44± 0.10	0	64.42 ±3.04
HIGH	4.21±0.10	9255.51 ± 41.32	12.10 ± 0.69	32.16 ± 1.3	1.97 ± 0.05	3.57 ± 0.25	0	62.3 ± 2.76

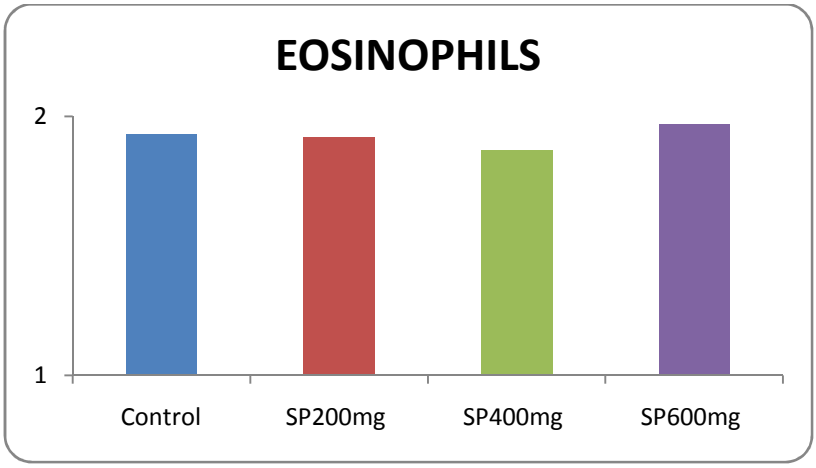
Values are expressed as mean ± SEM Statistical significance (p) calculated by one way ANOVA followed by Dunnett's (n=6); NS- non significant, *p<0.05, **p<0.01, ***p<0.001, calculated by comparing treated groups with control group.

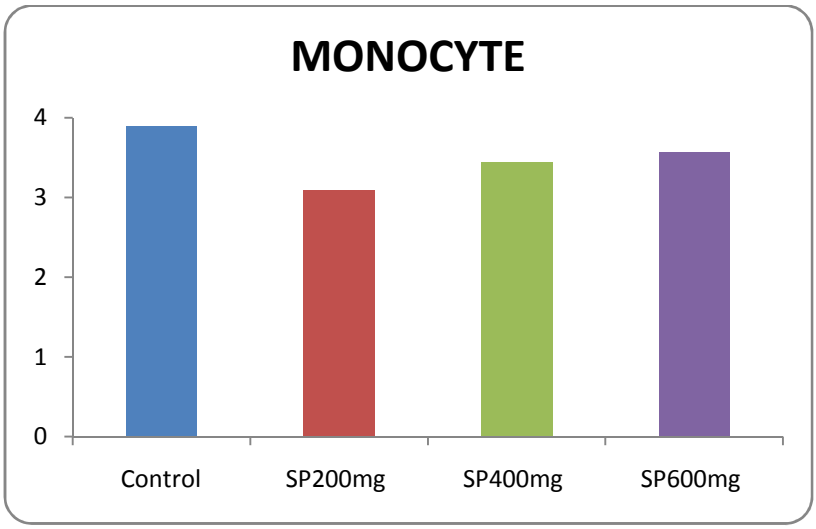



WBC
9600
9550
9500
9450
9400
9350
9300
9250
9200
9150
9100
Control
SP200mg
SP400mg
SP600mg


HAEMOGLOBIN
13
12
11
10
Control
SP200mg
SP400mg
SP600mg


NEUTROPHILS
33
32
31
30
29
Control
SP200mg
SP400mg
SP600mg


EOSINOPHILS
2
1
Control
SP200mg
SP400mg
SP600mg


MONOCYTE
4
3
2
1
0
Control
SP200mg
SP400mg
SP600mg

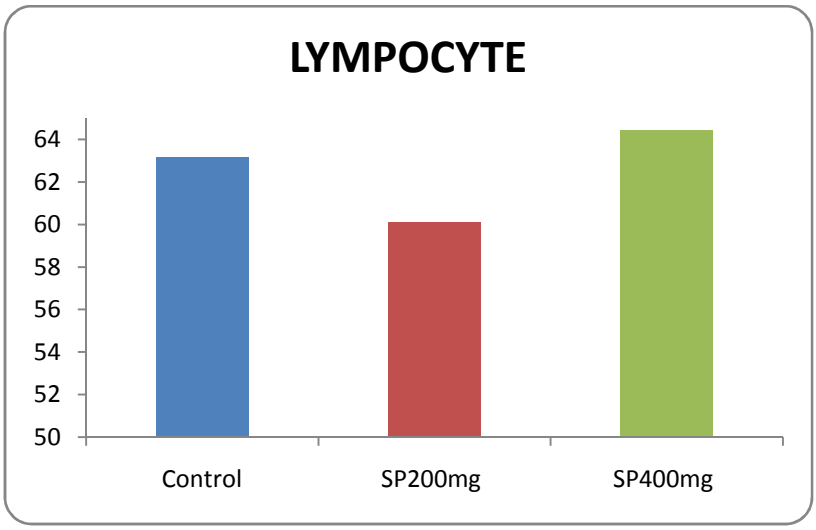
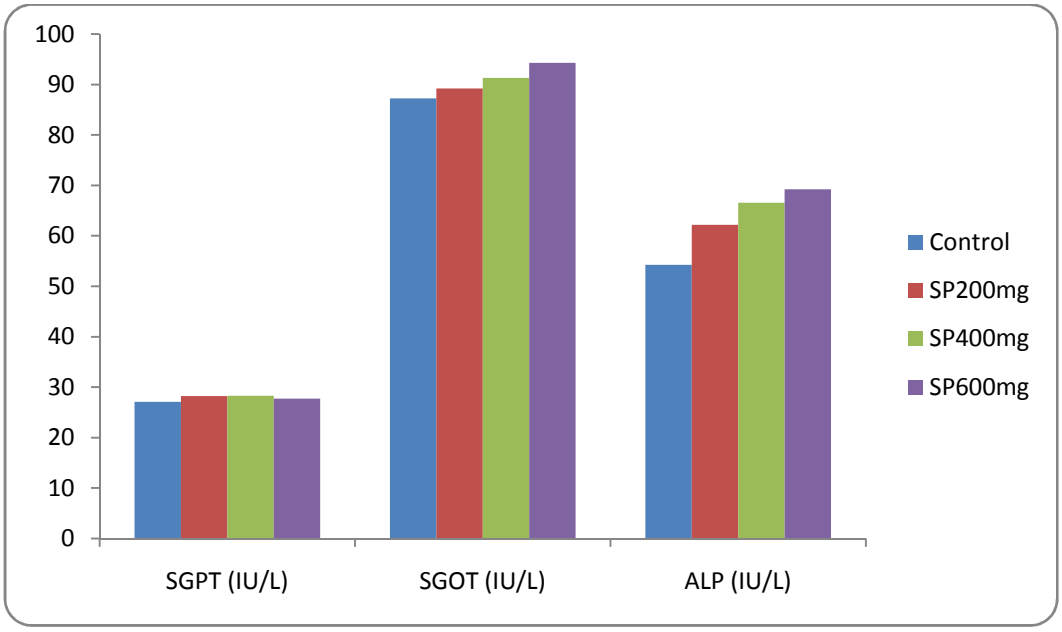
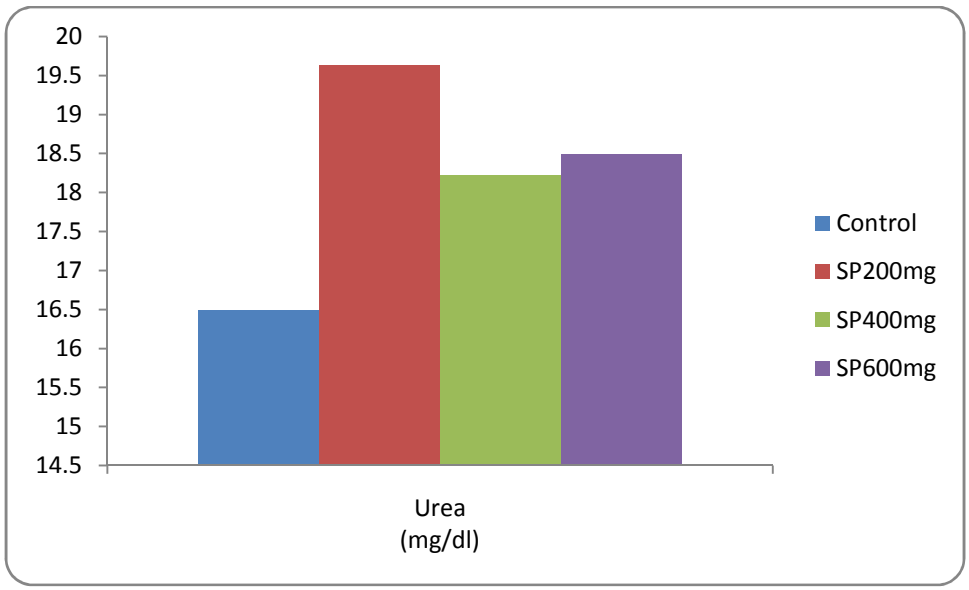

LYMPOCYTE
64
62
60
58
56
54
52
50
Control
SP200mg
SP400mg

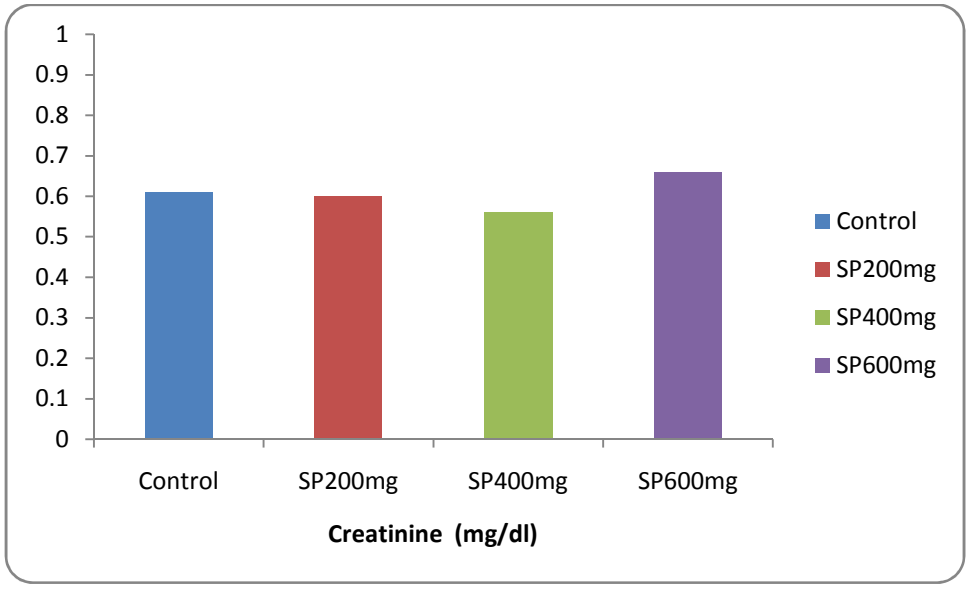
Table - 26 RESULTS OF SUB- ACUTE TOXICITY STUDY (28 DAYS) OF *SANGU PARPAM* ON BIOCHEMICAL PARAMETERS

Drug Treatment	SGPT (IU/L)	SGOT(IU/L)	ALP(IU/L)	Urea (mg/dl)	Creatinine(mg/dl)
Control	27.11±3.03	87.25±1.71	54.22±11.43	16.49±3.0	0.61±0.03
LOW	28.24±3.323	89.24±1.01	62.21±12.1	19.64±2.82	0.60±0.01
MID	28.32±1.11	91.31±2.62	66.56±5.51	18.22±2.22	0.56±0.01
HIGH	27.71±3.30	94.31±1.72	69.22±11.43	18.49±3.00	0.66±0.03

Values are expressed as mean ± SEM Statistical significance (p) calculated by one way ANOVA followed by Dunnett's (n=6); NS- non significant, *p<0.05, **p<0.01, ***p<0.001, calculated by comparing treated groups with control group.




20
19.5
19
18.5
18
17.5
17
16.5
16
15.5
15
14.5
Control
SP200mg
SP400mg
SP600mg
Urea
(mg/dl)


1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
Control
SP200mg
SP400mg
SP600mg
Creatinine (mg/dl)

HISTOPATHOLOGICAL OBSERVATIONS

EFFECT OF *SANGU PARPAM* ON HISTOPATHOLOGICAL CHANGES IN RAT ORGANS

Group –I – Control

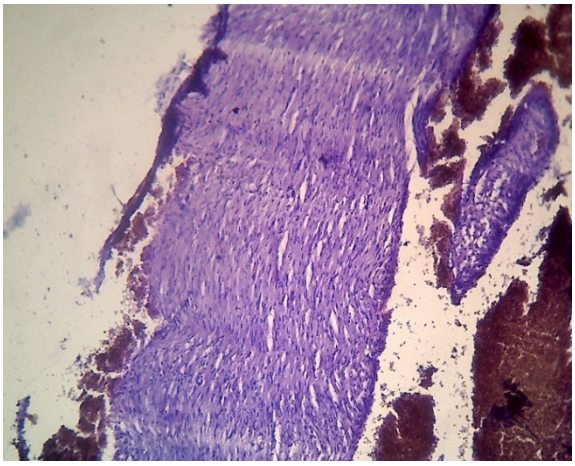
Name : **K.BALA SUBRAMANIAN – RAT-NORMAL**

Ref by Dr. : **Sample Received Date**: **08.05.2018**

Specimen : **HEART – NORMAL** **Sample Reported Date:** **20.05.2018**

BIOPSY NO : 736 / 2018

Clinical Details:



Clinical Diagnosis :

Macroscopic :

Microscopic:

Normal cardiac muscle fibres seen.

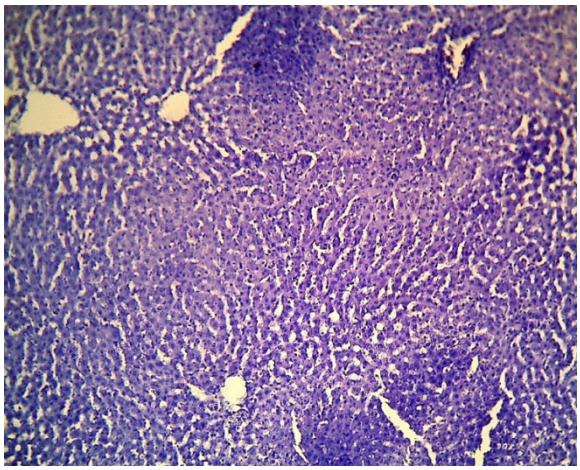
Name : **K.BALA SUBRAMANIAN – RAT- NORMAL**

Ref by Dr. : **Sample Received Date**: **08.05.2018**

Specimen : **LIVER - NORMAL** **Sample Reported Date:** **20.05.2018**

BIOPSY NO : 732 / 2018

Clinical Details:



Clinical Diagnosis :

Macroscopic :

Microscopic:

Normal liver parenchyma seen.

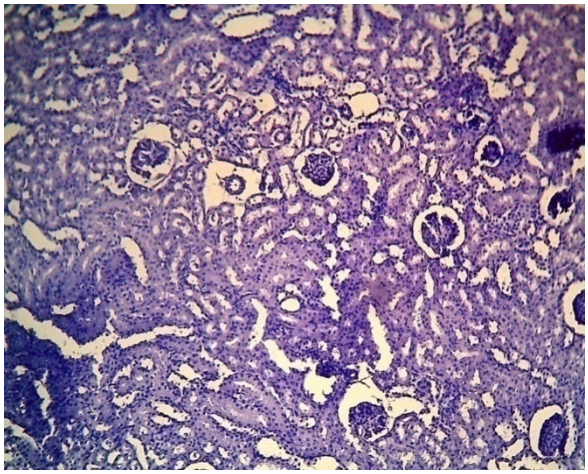
Name : **K.BALA SUBRAMANIAN – RAT-NORMAL**

Ref by Dr. : **Sample Received Date**: **08.05.2018**

Specimen : **KIDNEY - NORMAL** **Sample Reported Date:** **20.05.2018**

BIOPSY NO : 744 / 2018

Clinical Details:



Clinical Diagnosis :

Macroscopic :

Microscopic:

Normal renal parenchyma seen.

Group – II Low dose 200mg/kg/Animal

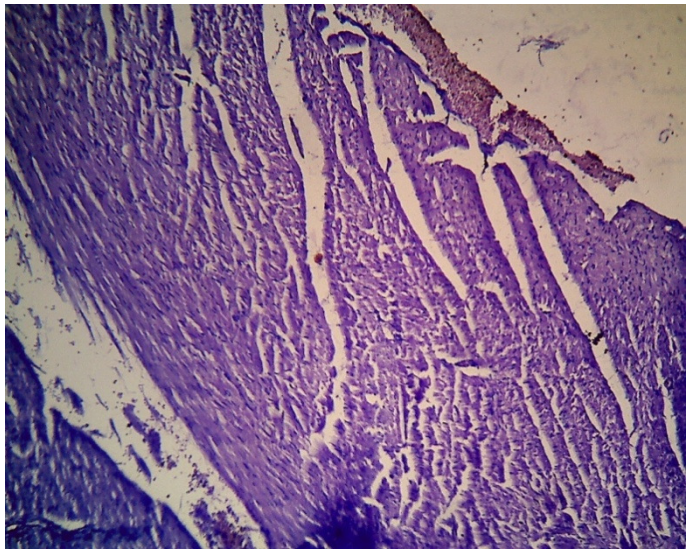
Name : **K.BALA SUBRAMANIAN – RAT-LOW DOSE**

Ref by Dr. : **Sample Received Date**: **08.05.2018**

Specimen : **HEART – G1** **Sample Reported Date:** **20.05.2018**

BIOPSY NO : 737 / 2018

Clinical Details:



Clinical Diagnosis :

Macroscopic :

Microscopic:

Normal cardiac muscle fibres seen.

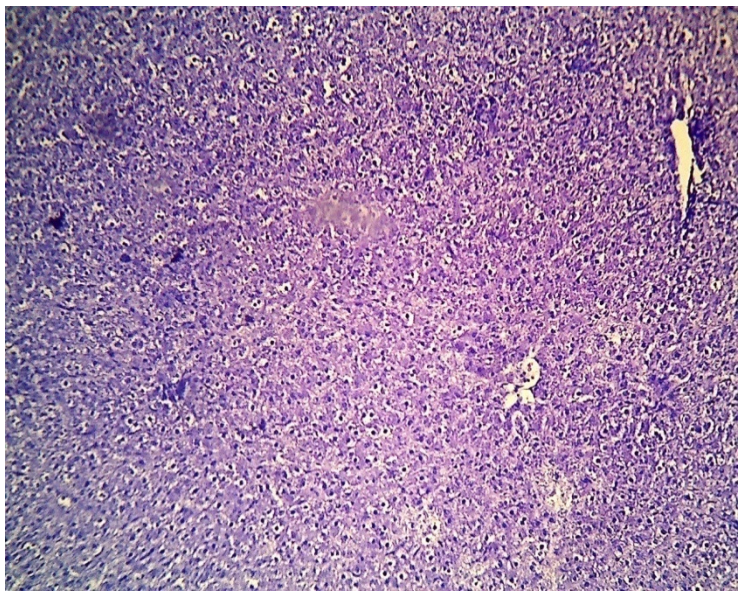
Name : **K.BALA SUBRAMANIAN – RAT- LOW DOSE**

Ref by Dr. : **Sample Received Date**: **08.05.2018**

Specimen : **LIVER – G1** **Sample Reported Date: 20.05.2018**

BIOPSY NO : 733 / 2018

Clinical Details:



Clinical Diagnosis :

Macroscopic :

Microscopic:

Normal liver parenchyma seen.

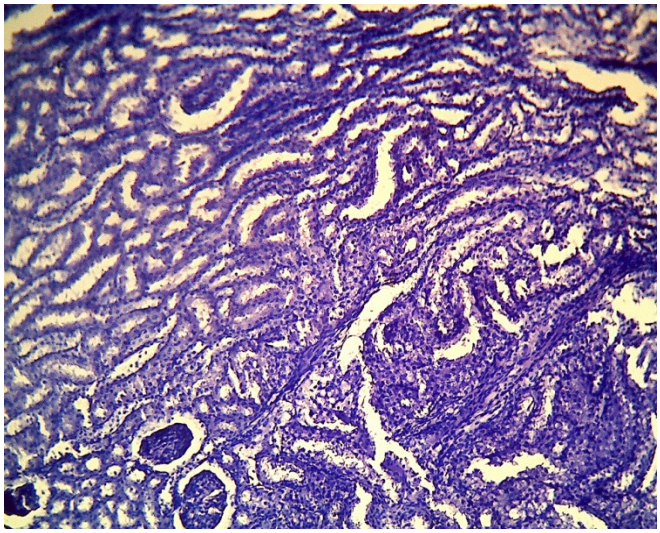
Name : **K.BALA SUBRAMANIAN – RAT-LOW DOSE**

Ref by Dr. : **Sample Received Date**: **08.05.2018**

Specimen : **KIDNEY – G1** **Sample Reported Date:** **20.05.2018**

BIOPSY NO : 745 / 2018

Clinical Details:



Clinical Diagnosis :

Macroscopic :

Microscopic:

Normal renal parenchyma seen.

Group – III Mid dose 400mg/kg/Animal

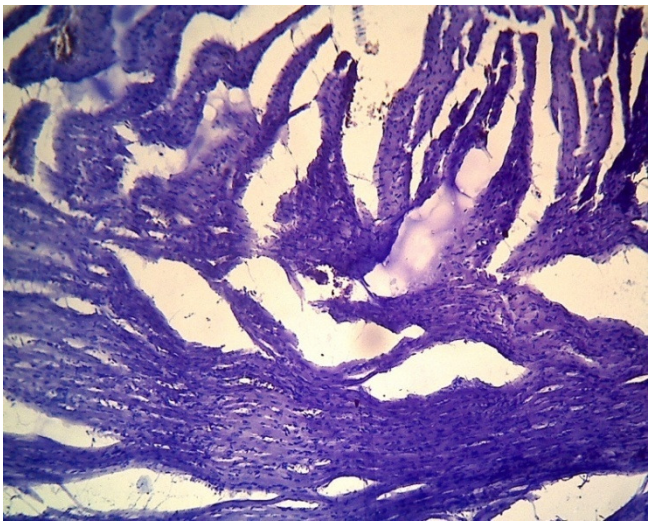
Name : **K.BALA SUBRAMANIAN – RAT-MIDDLE DOSE**

Ref by Dr. : **Sample Received Date**: **08.05.2018**

Specimen : **HEART – G2** **Sample Reported Date:** **20.05.2018**

BIOPSY NO : 738 / 2018

Clinical Details:



Clinical Diagnosis :

Macroscopic :

Microscopic:

Normal cardiac muscle fibres seen.

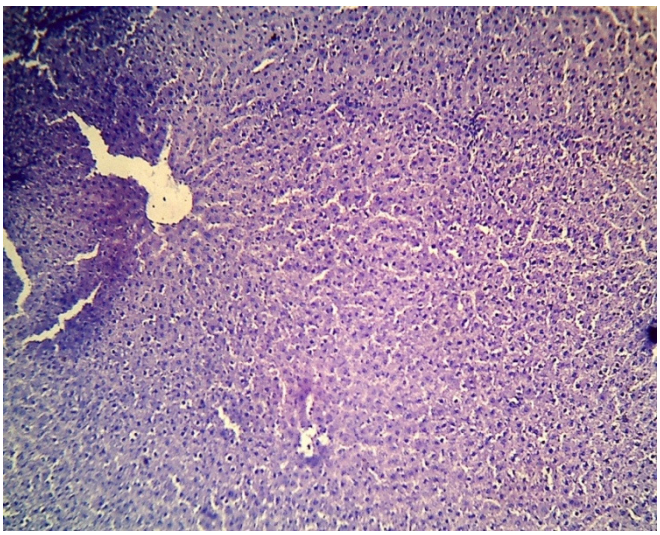
Name : **K.BALA SUBRAMANIAN – RAT- MIDDLE DOSE**

Ref by Dr. : **Sample Received Date**: **08.05.2018**

Specimen : **LIVER – G2** **Sample Reported Date:** **20.05.2018**

BIOPSY NO : 734 / 2018

Clinical Details:



Clinical Diagnosis :

Macroscopic :

Microscopic:

Normal liver parenchyma seen.

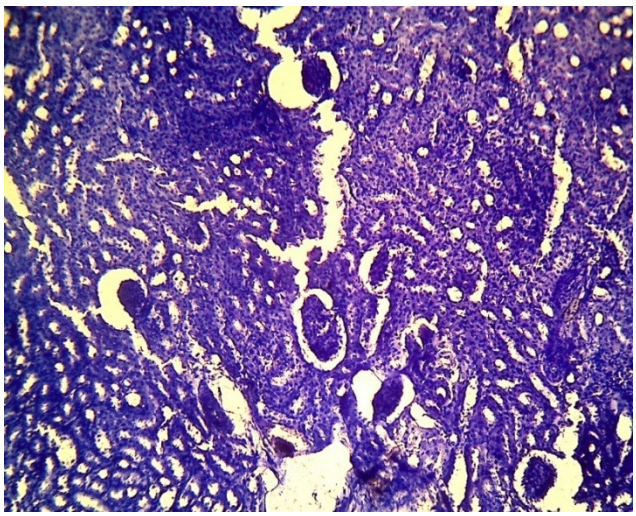
Name : **K.BALA SUBRAMANIAN – RAT-MIDDLE DOSE**

Ref by Dr. : **Sample Received Date**: **08.05.2018**

Specimen : **KIDNEY – G2** **Sample Reported Date:** **20.05.2018**

BIOPSY NO : 746 / 2018

Clinical Details:



Clinical Diagnosis :

Macroscopic :

Microscopic:

Normal renal parenchyma seen.

Group – IV High dose 600mg/kg/Animal

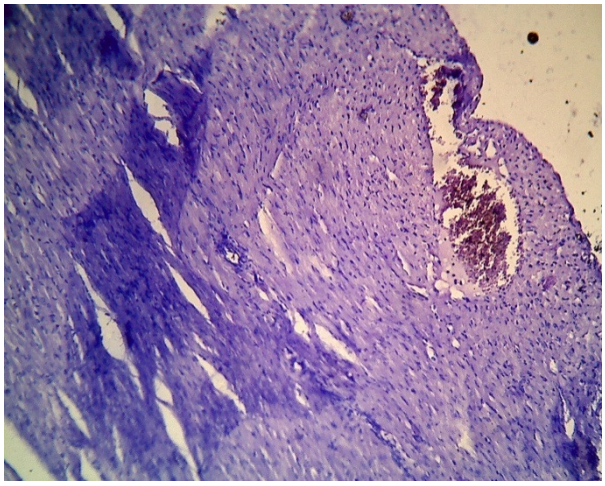
Name : **K.BALA SUBRAMANIAN – RAT-HIGH DOSE**

Ref by Dr. : **Sample Received Date**: **08.05.2018**

Specimen : **HEART – G3** **Sample Reported Date:** **20.05.2018**

BIOPSY NO : 739 / 2018

Clinical Details:



Clinical Diagnosis :

Macroscopic :

Microscopic:

Normal cardiac muscle fibres seen.

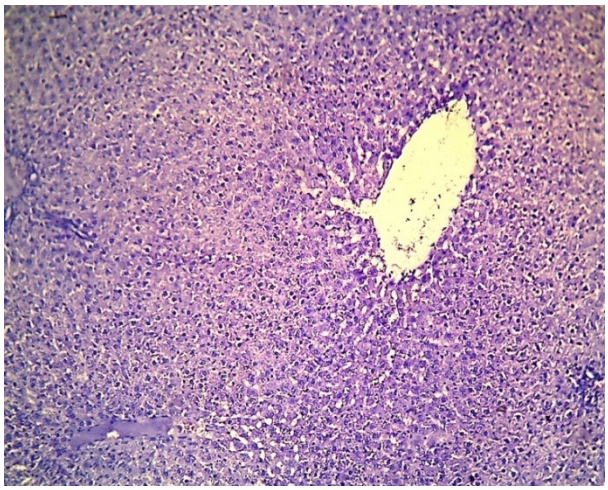
Name : **K.BALA SUBRAMANIAN – RAT-HIGH DOSE**

Ref by Dr. : **Sample Received Date**: **08.05.2018**

Specimen : **LIVER – G3** **Sample Reported Date:** **20.05.2018**

BIOPSY NO : 735 / 2018

Clinical Details:



Clinical Diagnosis :

Macroscopic :

Microscopic:

Normal liver parenchyma seen.

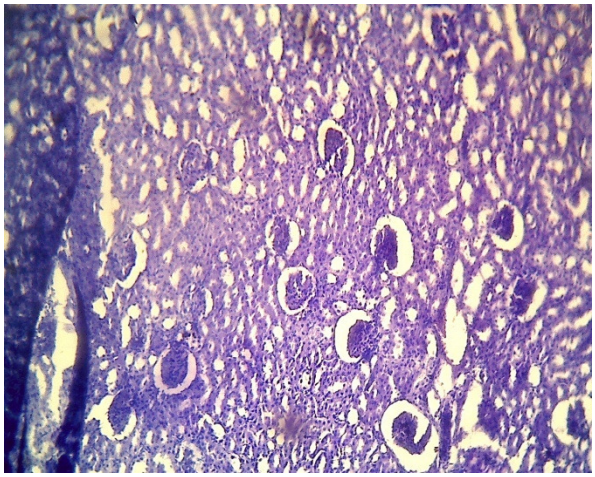
Name : **K.BALA SUBRAMANIAN – RAT-HIGH DOSE**

Ref by Dr. : **Sample Received Date**: **08.05.2018**

Specimen : **KIDNEY – G3** **Sample Reported Date:** **20.05.2018**

BIOPSY NO : 747 / 2018

Clinical Details:



Clinical Diagnosis :

Macroscopic :

Microscopic:

Normal renal parenchyma seen.

6.0 RESULTS:

CLINICAL SIGNS:

All animals in this study were free of toxic signs throughout the dosing period of 28 days.

Mortality:

All animals in control and in all the treated dose groups survived throughout the dosing period of 28 days.

Body weight:

The effect of ***SANGU PARPAM*** on body weight during 28 days treatment in rats was given in table 21. There was no significant change in the body weight compared to control with both the doses of ***SANGU PARPAM*** during 28 days treatment.

Food consumption:

The effect of ***SANGU PARPAM*** on food intake during 28 days treatment in rats was given in table 22. ***SANGU PARPAM*** did not alter the food intake at both the dose levels as compared to control during the 28 days treatment. It indicates that it does not influence food intake.

Water consumption:

The effect of ***SANGU PARPAM*** on water intake during 28 days treatment in rats was given in table 23. ***SANGU PARPAM*** did not alter the water intake at both the dose levels as compared to control during the 28 days treatment. There was no significant change in water intake as compared to control.

Organ Weight:

Group Mean Relative Organ Weights (% of body weight) are recorded in Table No.24 Comparison of organ weights of treated animals with respective control animals on day 28 was found to be comparable similarly.

Hematological investigations:

The results of hematological investigation (Table.25) conducted on 28th day revealed following significant changes in the values of different parameters investigated when compared with those of respective controls; however, the increase or decrease in the values obtained was within normal biological and laboratory limits or the effect was not dose dependent.

Biochemical Investigations:

Results of Biochemical investigations conducted on 28th day and recorded in revealed the following significant changes in the values of hepatic serum enzymes studied. When compared with those of respective control. However, the increase or decrease in the values obtained was within normal biological and laboratory limits.

Histopathology:

In histopathological examination, revealed normal architecture in comparison with control and treated animal.

7.0 DISCUSSION:

1) All the animals from control and all the treated dose groups up to 600 mg/kg survived throughout the dosing period of 28 days.

2) No signs of toxicity were observed in animals from different dose groups during the dosing period of 28 days.

3) Animals from all the treated dose groups exhibited comparable body weight gain with that of controls throughout the dosing period of 28 days.

4) Food consumption of control and treated animals was found to be comparable throughout the dosing period of 28 days

5) Haematological analysis conducted at the end of the dosing period on day 28, revealed no abnormalities attributable to the treatment.

6) Organ weight data of animals sacrificed at the end of the dosing period was found to be comparable with that of respective controls.

7) Histopathological examination revealed normal architecture in comparison with control and treated animal.

8.0 SUMMARY AND CONCLUSION:

In conclusion ***SANGU PARPAM*** can be considered safe, as it did not cause either any lethality or adverse changes with general behavior of rats and also there were no observable detrimental effects **(200 to 600 mg/kg body weight)** over a period of 28 days. Our results have demonstrated that the ***SANGU PARPAM*** is to be relatively safe when administered orally in human for long period.

BIOSTATISTICAL ASPECTS

Biological assay refers to assessment of the potency of vitamins, hormones, toxicants and drugs of all types by means of the responses produced when doses are given to experimental animals. In every dose response situation, two components must be considered; the Stimulus and the Subject.

The stimulus is applied to the Subject as a stated dose namely concentration, weight, time or appropriate measure. The subject manifest a response, the level of intensity below which the response does not occur & above which the response occur, such a value has often been called threshold. But the term tolerance is now widely accepted.

MEDIAN EFFECTIVE DOSE (ED50)

It is the dose which produces the desired response in half the animal population tested.

MEDIAN LETHAL DOSE (LD 50)

It is the dose which kills half the population of the animal tested.

LD50 Measurment(Toxicity)

- If the test compound shows any pharmacological activity then the LD50 of the drug is determined.
- By determining the LD50, we can justify whether to proceed with the drug or not.

Table - 27

Acute Toxicity Study Analysis

Group	Dose in mg / kg	No. of rats	No. of rats died
I	Distilled water (1ml/kg)	3	-
II	5	3	-
III	50	3	-
IV	300	3	-
V	2000	3	-

Since there was no mortality of the animal in acute toxicity study, lethal dose of drug could not be calculated.

Table - 28

Subacute Toxicity Study Analysis

Group	Dose (mgs / kg)	No. of rats	Days	No. of rats died
I	Control	6 (3 M + 3F)	28	-
II	200	6 (3 M + 3F)	28	-
III	400	6 (3 M + 3F)	28	-
IV	600	6 (3 M + 3F)	28	-

In case of Subacute Toxicity Study, with the help of physiological parameters such as Hematological investigations and with the histopathological studies the drug reaction within the animal can be assessed and are being tabulated respectively.

Lethal dose of the drug ***"SANGU PARPAM "*** can be calculated with higher dose level of the drug which can be done in further studies.

From the above biostatistical measures ***"SANGU PARPAM"*** is safe upto the dose level 600mg/kg body weight of the animal.

DISCUSSION

- ✓ The present study with ***SANGU PARPAM*** was conducted with an objective to find out whether this drug has got any side effects or adverse reactions in short and Long term administration
- ✓ ICP OES analysis indicates that Aluminium, Arsenic, Cadmium, Copper, Mercury, Nickel and Lead are in below detection Limit.
- ✓ FTIR analysis of ***SANGU PARPAM*** indicates the presence of Aromatic compounds, Alkynes, Alkene, Alkyl halide, Alcohol, Acyl chloride, Esters, Carboxylic acids, Amides and Amines.
- ✓ SEM analysis indicated that the particle size were in Range 0.5-2 micron.
- ✓ Biochemical Analysis of ***SANGU PARPAM*** indicates the presence of Calcium, Sulphate, Chloride, Carbonate and Ferrous iron.
- ✓ On the basis of acute toxicity Results the study shows that ***SANGU PARPAM*** did not produce any toxic Efficacy for the dose of 2000mg/kg to rats.
- ✓ On the basis of subacute toxicity Results, the study reveals that ***SANGU PARPAM*** did not cause either any lethality or adverse changes with general behaviour of rats and also there were no observable detrimental effects (200 to 600mg/kg body weight) over a period of 28 day.
- ✓ In histopathological examination revealed normal architecture in comparison with control and treated animal.
- ✓ Haematological analysis revealed no abnormalities attributable to the treatment.
- ✓ These results indicate that ***SANGU PARPAM*** upto 200-600mg/kg body weight no changes occured.

SUMMARY

- ✓ The medicine ***SANGU PARPAM*** was taken for the dissertation work based on ***Dr. R. Thiyagarajan, L.I.M., Gunapadam Thathu Jeevam, 2013; Pg. No. 646.***
- ✓ The aim of this dissertation is to study the acute and sub-acute toxicity of the medicine ***SANGU PARPAM*** administered at various presumed moderate dosage, in the experimental animals.
- ✓ The Ingredients of ***SANGU PARPAM*** are Sangu and Keezhanelli. The sangu were purchased from fishermen of Tiruchendur Seashore and Keezhanelli collected from Moolikulam region.
- ✓ The raw samples were taken for purification and the test medicine was prepared, as per the method narrated in the literature.
- ✓ The drug was analysed for its physicochemical properties and contents by using qualitative biochemical analysis and modern techniques such as inductively couped plasma-optical emission spectrometry.
- ✓ Depending upon the result of these analysis the contents of test sample was identified.
- ✓ By scanning electron microscope (SEM), the size of the particles about 0.5-2 micron, were analyzed.
- ✓ The study was done at Department of Pharmacology, Arulmigu Kalasalingam University, Krishnankovil, Virudhunagar District.
- ✓ To evaluate the acute toxicity study 15 rats were selected and divided into 5 groups (Group I,II,III,IV,V) and they were administered with the drug with different graded doses ranging from Control, 5mg/kg, 50mg/kg, 300mg/kg and 2000mg/kg. Body weight animal orally with control group. Daily the animals were observed for clinical signs and mortality. The drug did not produce any mortality and is safe upto 2000mg/kg body weight.
- ✓ Sub acute Toxicity was conducted for about 28 days duration. No signs of toxicity was observed in animals from different dose groups during the dosing period.
- ✓ The haematological index shows no significant changes

- ✓ During long term administration of the drugs at both low dose and high dose SGOT, SGPT, Serum Urea, Serum Creatinine level found to be within the normal range.
- ✓ There is no remarkable histopathalogical changes.
- ✓ Biostatistical measures to the acute and subacute toxicity studies shows the drugs ***"SANGU PARPAM*** " found to be safe up to 2000mg/kg body weight of the animal in acute toxicity study and found to be safe upto 600mg/kg body weight of the animal in sub-acute toxicity study.

In this study since there is no mortality, the lethal dose of drug could not be calculated

CONCLUSION

From acute toxicity study it was observed that the administration of ***SANGU PARPAM*** up to the dose of 2000 mg/kg to the Wistar Albino Rats did not produce drug-related toxicity and mortality. So No-Observed-Adverse-Effect- Level (NOAEL) of ***SANGU PARPAM*** is 2000 mg/kg.

The subacute toxicity studies also reveals that the drug ***"SANGU PARPAM"*** can be considered safe, as it did not produce either any lethality or adverse changes with general behaviour of rats and also there were not observable determental effects in the doses (200 to 600 mg/kg body weight) over a period of 28 days. It is concluded that the "***SANGU PARPAM*** " is relatively safe in long administration upto the dose of 600mg/kg.

BIBLIOGRAPHY

1. Dr. R. Thiyagarajan, Gunapadam Thathu Jeeva Vaguppu, Edition 2013, Department of Indian Medicine and Homeopathy, Pg. No. 641 – 648.
2. R.C. Mogam, Pathinen Siddharkal Aruli Seitha Pathartha Guna Cinthamani (Moolamum Uraiyum), IIIrd Edition.
3. Dr.C. Kannusamy Pillai, Sikitcha Ratnadeepam, Part – II
4. Dr. K.S.Murugesa Mudaliyar, Dr. Pon. Guru sironmani, Kuzhanthai Maruthuvam, 2016.
5. The siddha formulary of India, Part – II, Tamil version, First Edition.
6. Dr.S.Venkatarajan, L.I.M, Agathiyar 2000, Part – III, 5th Edition, Published on October 2002.
7. தமிழ், ஆங்கில அகராதி (T.V. Sambasivam Pillai, Directorate of Indian Medicine and Homeopathy Chennai, 1985)
8. Dr.S. Somasundaram, Taxonomy of Angiosperm, 2011 Edition.
9. Rajinder Sharma, Tarun Gupta, Encyclopaedia of Medicinal Plants
10. The wealth of India first supplement series (Raw material series), Vol- IV, 2006 Edition.
11. Kirtikar & Basu's Indian medicinal plants.
12. Dr.K.M. Nadkarni's Indian materia medica, Vol – II, Pg. No. 164.
13. S.N. Yoganarasimhan, Medicinal plants of India Vol- II. Pg. No. 410, 2000th Publication
14. N.Adiyaman, Sangu, First Edition 2005.
15. Dr.K.S. Murugesa Mudaliyar, Gunapadam Part I - Mooligai vaguppu – 2008 (Pg. No.345 – 347)
16. K.D.Tripathi M.D., Essential of Medical Pharmacology.
17. Padmaja Udayakumar, Medical Pharmacology, Fifth Edition.
18. B.Mukherji, The wealth of Indian Alchemy and Its Medicinal uses, Vol – I, Pg.No. 195.
19. Hakkem . P. M. Abdullah Sayubu, Anuboga Vaithiya Navaneetham, Part – III.
20. OECD Guideline 423 for Acute oral toxicity.
21. OECD Guideline 407 for sub acute toxicity.
22. Hornell, Indian Molluscs, 1951.

23. Hornell, The scared chank of India, 1914
24. C. Kannusamy Pillai, Kannusamy Parambarai Vaithiyam Pg. No. 251.
25. Agathiyar Vaithiya Kandam, Pg. No. 90.
26. The wealth of India Volume – VII (Pg. No. 56)
27. Krishnamoorthy, K. Sanga Ilakkyathil Sangu, Unnamalai Publication, Chidambaram.
28. Research Article ISSN: 2348 – 8069, Vol.3, Issue 6 – 2016, A review on medicinal uses of Sangu (Conch) with Siddha Medicine Perspectives by R. Madhavan and M. Murugesan
29. Research Article P – ISSN : 2348 – 5213; e- ISSN : 2348 – 5221, Volume - 3, Issue 6 – 2016, Standardization of ***SANGU PARPAM*** a Herbo Marine Siddha drug by R. Madhavan, R. Sathish and M. Murugesan
30. Research Article, Analysis and characterization of the Traditional siddha formulation ***SANGU PARPAM*** through Fourier Transform Infra – Red Spectroscopy by Rajamaheswari. K and Rajasekaran. M. ISSN: 0975-7538 CODEN (USA) : JCPRC5
31. Deepak Apte, The Book of Indian Shells, Pg. No. 82.
32. Websites :
    - www.wikipedia.org
    - www.indianmedicinalplants.in